ELECTRODYNAMIC control of Ordered Energy

Structural Dynamics of DNA control the cell. Bioelectromagnetic field which control intracellularly control the cell

Case Number

Lead Inventor Anthony S. Fuccione

Categories

New energy source
EMF, SMF power lines, cell phone, electrical machines, etc
Magnetic Shielding
Biosensors: based on genetic function
Cellular Biology
Embryology
Physiological
Diagnostics
Molecular Biology
Cancer research
Gene expression
MRI based on bioelectromagnetic fields
Physics Motor and Computer Nanotechnology
Molecular Motors
DNA computer: though the dynamics of DNA intercellular compositions
Supercomputers
Software systems
Superconducting Quantum Interference Devices (SQUIDS)
Energy medicine
Explanation of whole genomes

Which include responses to intercellular composition, extracellular signals growth factors, chemicals, harmonics, vibrations, frequencies, light, and its ability reproduce.

Summary

Cellular response to intercellular DNA electrostatics to anisotropy affects and effects in understudied phenomenon with extremely broad implications. An invention from Anthony S. Fuccione describes systems and methods for measuring the electrostatic (which are dynamic) **electrodynamics** properties of a cell. The electrodynamic properties of DNA within the cell govern its activity, its ability to precisely illicit responses to intercellular composition, extracellular signals growth factors, chemicals, harmonics, vibrations, frequencies, light, and its ability reproduce. The characterization of these properties will not only increase the general understanding of cellular reproduction, cell

electronic

Bioelectromagnetic

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Proposal:

I am seeking a forum in which to present my findings while protecting intellectual property.

Communicate and disseminate information regarding theory while protecting intellectual property.

Gain acceptance of theory and work toward the understanding of the theory and its practical implications via patent protection.

To publish, accurately communicating theory, (possibly aimed at Ph.D. thesis) and maximized capital gains.

This presentation is not inclusive it is to serve as a cursory review of theory.

9/15 sent Levin 1 page summary

9/16 Levin 6 page document

155 Ocean Street
Lynn, Massachusetts 01902
31 August 2002
(781) 599-7550

Upstate Biotechnology
c/o Mr.Scott D. Paschke
10 Old Barn Road
Lake Placid, New York 12946

Dear Mr. Paschke:

Enclosed you will find a presentation introducing you to bioelectromagnetic fields and the electrodynamics of cell controls and reproduction.

The information contained holds the promise of the biotechnology industry.

I am looking forward to discussing the possibilities that exist. This presentation is not inclusive. It is to serve as a cursory review of theory.

Sincerely,

Anthony S. Fuccione

Enclosed: Proposal
Introduction
Notebook
(Two copies)

c.c. Michael Meagher, Esquire

Introduction

WE have concentrated so long and so hard on what goes wrong we have not looked at all that goes right.

The science of the theory is solid, logical and it shows a mechanism with unparalleled explanation of cellular life.

Ultimate intelligent ~~cellular~~ design of a cell DNA is based on a simple cyclical operating system a magnetic field. It functions electrodynamically in exceedingly ordered, creates and functions in a bioelectromagnetic field directing cellular life through electromagnetic mechanics. dna is the reception

There is always symmetry between DNA replication/transcription by balance of charge, magnetic force. The bioelectromagnetic field is produced intracellularly during replication by the downward spiral of phosphorylation and the upward composition of DNA.

The highest ordered state of DNA is chromatin during metaphase which substantiates the bioelectromagnetic mechanism.

Four elemental ions (Na, K, Ca2+, Mg2+) act in respond to the four bases and their pairing within DNA. Na stabilizes GC and K stabilizes AT. Ca2+ interacts with AT bands and Mg2+ with GC bands. This occurs in highly structured behavior called ordered energy. The cell know to be electronic in nature only though it plasma membrane. Ions always move down their electrochemical gradient.

The electrodynamics of the cell function fluxing the capacitance of DNA ~~yields~~ creates electrochemical gradient and pH changes intracellularly. The change in ion specificity drives molecular motors in the ordered energy systems. The ordered energy system functions of motors are activated by terminus, positive and negative. The specificity of driving the motors is p.H., ion and environment conditions.

The controls of the cell system are electronic, yet the magnetic component of the electrical system appears minor; however, is the more important dynamic. The intrinsic structure of the DNA molecule, in function and structure, directs electrochemical energies to electromagnetic fields (bioelectromagnetic fields).

DNA intracellularly orchestrates biochemical synthesis using electrochemical energy creating bioelectromagnetic controlling cellular life.

PHYSICS

The highly negative phosphate back bone of DNA serves as a track or wave guide for electromagnetic energy flow around the backbone that creates a Poynting flux. Simultaneously inside DNA the nucleotides charge due to (electron) Hydrogen-bonding of base pairs and drives conduction current according to Ohms law. The energy flows in space near the backbone. During replication (or transcription to balance charge) there are leading and lagging strains which lead to the continuous conduction though out the molecule.
Electromagnetic field energy flows from open to blocked DNA circuits so that an equipotential exists though out the DNA.

Light energy biopolaron maybe proton(ic) yet magnetic energy is electron(ic).

2

Although untraditional a biological cell is an electronic structure; however, examining mechanical energy of the plasma membrane, cytosolic environment, and DNA the cell is an electrical system.

1

The plasma membrane is electrogenic and functions to move ions (ionic flux) up there electrochemical gradient.

The ionic flux phosphorylate the cytosolic environment. The cytosolic environment increases p.H.(hydrogen ion flux) due to increasing phosphoric activity.

3

4 **DNA directly interacts with ions and electrons converting mechanical energy to magnetic energy. DNA controls the cell by bioelectromagnetic fields. (Magnetic energy)** The energy can flow both ways.

The design of DNA carries and holds electrical charge. The magnetic component of the charge can be represented as a poynting vector. DNA capacitance fluctuates and can reach a saturation point. Saturation of capacitance is achieved at metaphase. DNA structure controls are the magnetic component. The magnetic controls the cell from response to reproduction.

Ionic current through the plasma membrane gives chemical energy in the cytosol which powers electrons. The intrinsic structure of the DNA molecule, in function and structure, directs these electrochemical energies to electromagnetic fields (bioelectromagnetic fields).

DNA relative permeability transforms under the effect of mechanical or ionic current. The relative permeability results modification of the impedance of DNA regions from base pairing interactions to gene activity. The structural transition allows DNA to function as a magnetostrictive, magnetoelastic device, thus sensing its cellular and extracellular environment. ~~The sensory capabilities~~ include liquid, temperature, viscosity, density, sound, force, movement, pressure, vibration, light, chemical analyte consentrations. The sensory can be physically measured or remotely.(117,139)

The whole genome can be related to GC content and are reasonable for the genotype as the AT content are responsible for the phenotype.

Cellular divisions are the basis for all life. The actual mechanism of why cellular mitotic divisions take place and under what controls are poorly understood. In late December of 1996, I noticed a model of a magnetic field. It had been bothering me for the last three months...there was something in that magnetic field model. (The actual model is a rectangular box filled with fluid and iron fillings, a space in the middle of the model for a bar magnetic. When one shakes the model the fillings evenly distribute through out, upon insertion of the magnet an electro-magnetic field form) the resemblance of late prophase to that of a magnetic field is exact. *The controls of mitotic spindles and cellular divisions follow the laws of electro magnetic force?*

Could there be a relationship between a magnetic field and mitosis? The functionality of a cell during m phase clearly in my mind was a magnetic field deforming. The exquisite symmetry of the deformation of a magnetic filed inside the cell and the controls of cytokinesis seemed equivalent. This was the one percent inspiration that began my quest.

The deformation of a magnetic field quite easily visualized the formation of the field was the trick. I immediate attributed formation of the magnetic field to the structure of DNA. I worked out the biological cellular division, the structures of DNA, that lead up to this magnetic field.

" Dr. Watson and Dr. Cricks' helix turn helix model lends itself to the principles of physics especially directing a magnetic field. From a physics stand point one could call the DNA molecule a solenoid. A solenoid placed in an electromagnetic field would direct a line of force that here I suggest. DNA itself (helix 13.4 A turn helix) possess a highly negative phosphorus back bone guides not only RNA synthesis yet it's own as well. Self duplication Watson and Crick proved was a "negative" that produced a "positive."

Searching and discussing the possibilities of a magnetic field being responsible for controlling cell division were unproductive. I abandoned the possibility.

A year had passed and the cell theory haunted me. Reading books on magnetic fields their creation, the physic of their character the logic existed the comprehension did not. I focused on mitosis and using The Cell (Albert et al.) as my guide tracking the mechanics the understand became more sound. This was completely a biological picture I was painting. The logic appeared solid only in my mind and theoretical plausible upon discussion. I wrote a paper named energy 6.doc based in biology. I knew as I was writing energy.6doc that we needed to look at one cell first…from one many. The discrepancies of biological understand to physics were problematic.

."*I wish to suggest the intrinsic structure of the DNA molecule intracellularlly orchestrates biochemical synthesis using ectrochemical energy, thus directing replication of itself. This is accomplished though laws of physics, the structure of the DNA molecule in function and structure directing bioelectromagnetic fields."*
(Energy6.doc)

Frustration of relating biological system though chemical analysis to physics ~~mechanism~~ is so poorly understood. My thoughts on this being the mechanism of control remained ~~yet theoretical~~. Again I lay to rest the thoughts of explanations.

If DNA were responsible for the controls of a magnetic field there would need to be an electrical aspect. "DNA does not mediate an electrical charge" (140) and it is not well cited in literature. My understand was that there is a component of electrical energy and it need to be looked at not ignored. These were facts, not my mind.

Electrophoresis, one of the most powerful tools of the twentieth century, deals with a matrix in which size and charge aid in separation. Western blots, hplc, restriction enzyme all deal and can be answered though the biophysical properties of the molecules themselves. Chemotictics within organisms trigger many biochemical responses. As of a simplistic note from binary fission to the Shmoo, cells of Saccharomyces cerevisiae becoming polarized. In acarsis the "polar" bodies left behind, to drosophlia egg fertilization, nuclei in a syncytium, to nuclei migration to periphery and the "pole cell" to the posterior end. The "gray crescent" in xenopus all aid in the understanding of literal polarization and direction of synthesis by the most elementary organisms. Even "the induction of apoptosis by the p53 tumor suppresser gene encodes a transcription factor that regulates genomic stability" and ionizing radiation in high doses is one of the only effects that stops cell replication, thus exhibit the need for polarization to take place. Biosynthesis is a chemical catalysis that is autocatalytic mechanism possessing a behavioral relationship.

Bioelectromagnetic fields the name took me two weeks to accurately express, only to find that there was a group on yahoo named bioelectromagnetic. The group looks mostly at response of emf and on cells. I was looking at emf control of the cell. I researched biological articles that had anything to do with my bioelectromagnetic fields.

I have worked solely and relentlessly for the past year and exclusively for the past three months on this theory.

My theory shows the mechanism and implications of how the DNA mediates an electrical charge and signals. To make matter more difficult DNA and the cell are not traditionally view in this way. The evidence that they in fact are is overwhelming, yet counterintuitive to present knowledge.

My conclusion is that not only do bioelectromagnetic fields control cell division that they are the control of the cell.

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Contents Page

The following sections are a guide to give you more information on my theory. It is **not** inclusive it is to serve as a cursory review of my theory.

1) **Theory**: DNA harmonizes bioelectromagnetic field directing the cell
2) **Experiment:** Single eucaryotic cell (yeast) study
4) **Battery:** a model of DNA intracellularly functioning as a flux capacitor.
5) **Technology**: Patentable ideas pertaining to bioelectromagnetic theory
6) **Terminology:** explanation of new terminology
7) **References**: Cited articles and web links in explanation

After reading this introduction the most comprehensive overview is to view **References:** Numbers 1, 2, 5and 3 (in stated order) these are web linked and highly illustrative of theory.

The theory of bioelectromagnetic fields controls the cell cycle through the structure of DNA. DNA uses magnetic force to control the cell. The experiment, low technology is simple, highly reproducible, and clarifies theory. The experiment uses singular cells and shows ionic current systematically in a cell. A model for the electrodynamic activity of this is to consider a cell a battery and DNA to control the electrical charge of the system by magnetic force. Technology is patentable ideas which relate to the use of this knowledge. Terminology section is explanations of new terms used to relate the theory. References are scientific studies which lead to the overall function of a cell and the physics used to understand the "cell cycle". This section is not inclusive of all works.

Theory

THEORY

Cellular reproduction appears static at the middle of the cycle: metaphase. Metaphase has a striking resemblance to a magnetic field (1). To explore the relationship between a magnetic field and metaphase it is easy to see the deformation of the magnetic field as the chromosomes move to their respective poles (2).

The science of the theory is solid, logical and it shows a mechanism with an unparalleled explanation. The cell cycle control is accomplished by ionic current, transduction of ion specificity to many known and (unknown) signal pathways this is in a highly ordered fashion with the simplest ordering of the system. These transduction and switching pathways lead to the complexity and counterintuitive nature of logical scientific understanding. A cell functioning relates to the structural positional information of the DNA within the nucleus (outside as during cellular reproduction). A cell also is subject to environmental constraints: its' own structure and position with a biological system. The experiment shows the probability electron charge during cell cycling.

All life, in its most basic form, is cellular.

Electrostatics helps explains the magnetic forces (3). Electrostatic alone are not sufficient. Electrostatic forces are sprayed out radially at the stub end of the system, yet magnetic force requires completion of flux lines (131). Physics uses expressed physical laws such as electrostatics; however, traditional chemistry and consequently biology follows the Laws of Thermodynamics. Electrostatics are motionless and biology due to the (electro) chemical nature of life held within the physical laws, an Electrodynamical view appears more accurate (1T).

Electrochemical gradients "surrounding molecular electrostatic potentials (MEP)" (30) flow from highest concentration to their lowest. The receptor within a cell of these gradients is DNA (30). Fundamentally DNA is the most dynamic cellular component having transitional states wherein each state creates precise structural changes intracellularly producing precise functional response (1T electrodynamics). DNA carries all genetic information inside the nucleus, yet there are also genomic informational pathways. A single cell, possess an electrochemical gradient relative to its environment. Electron transfers are a result signal transduction due to ion flux. DNA directly interacts with ions and electrons converting mechanical energy to magnetic energy. (6, 9).

Energy harmonizes though the structure of DNA (6). DNA structurally functions though electrostatic interaction (14). DNA controls the cell by a bioelectromagnetic field
Magnetic force yields unparalleled explanation of cellular reproduction cell control and cellular response.

The intrinsic structure of the DNA molecule, in function and structure, directs electrochemical energies to electromagnetic fields (bioelectromagnetic fields). DNA intracellularly orchestrates biochemical synthesis using electrochemical energy creating bioelectromagnetic field directing intercellular constituents to replication of itself.

Magnetic Energy

Electromagnetic interactions in equilibrium and simple represented by a poynting vector containing an electrical (Q) and the accompanying magnetic (B) component. (Figure1) (15)

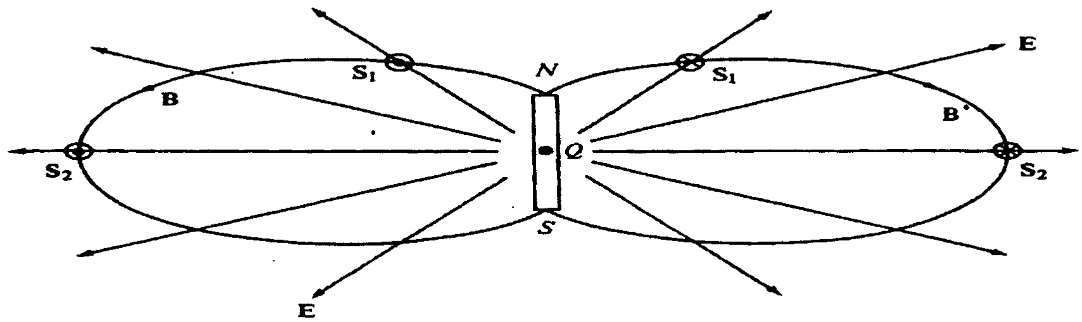


Figure 1

A poynting vector depicting point charge (Q) with a mutually orthogonal component, in a N (+) to S (-) direction, poynting flux (B).

An electromagnetic interaction most familiar is exhibited by a bar magnetic and iron filings showing lines of force.

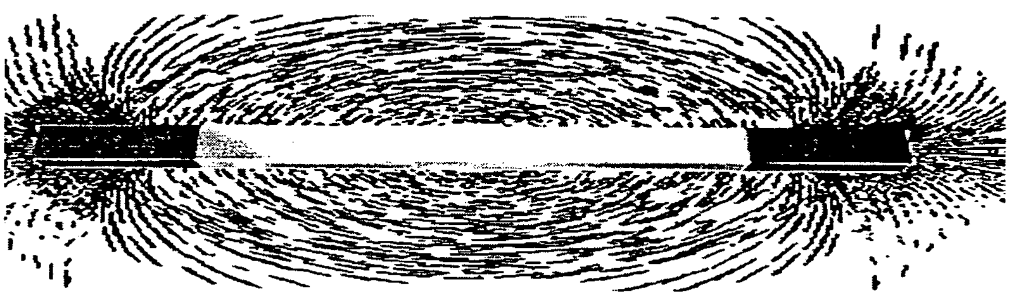


Figure 2

The unprecedented analogous electromagnetic flux becomes visible in a single biological cell during cellular reproduction at metaphase. The chromosomes appear held within an electromagnetic field (Biomagnetic field).

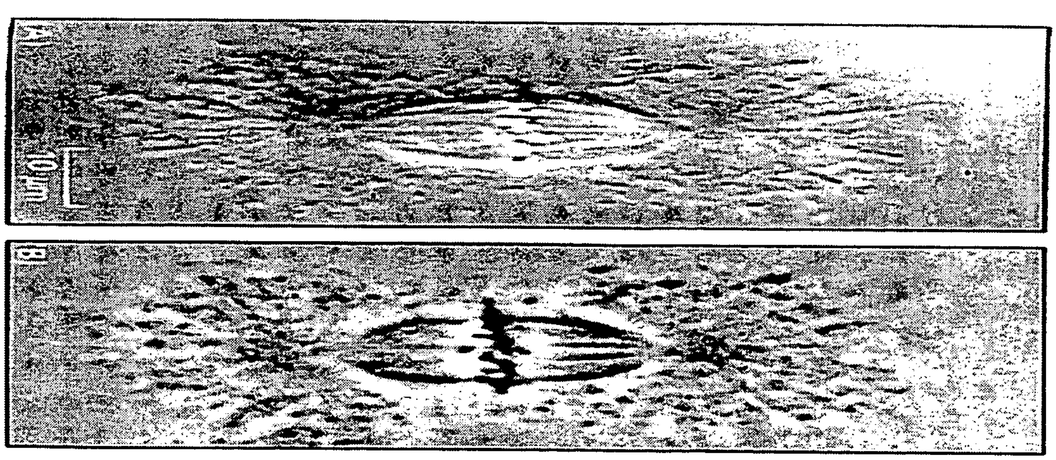


Figure 3

ELECTRODYNAMICS (1T) – A Magnetic equilibrium at Metaphase

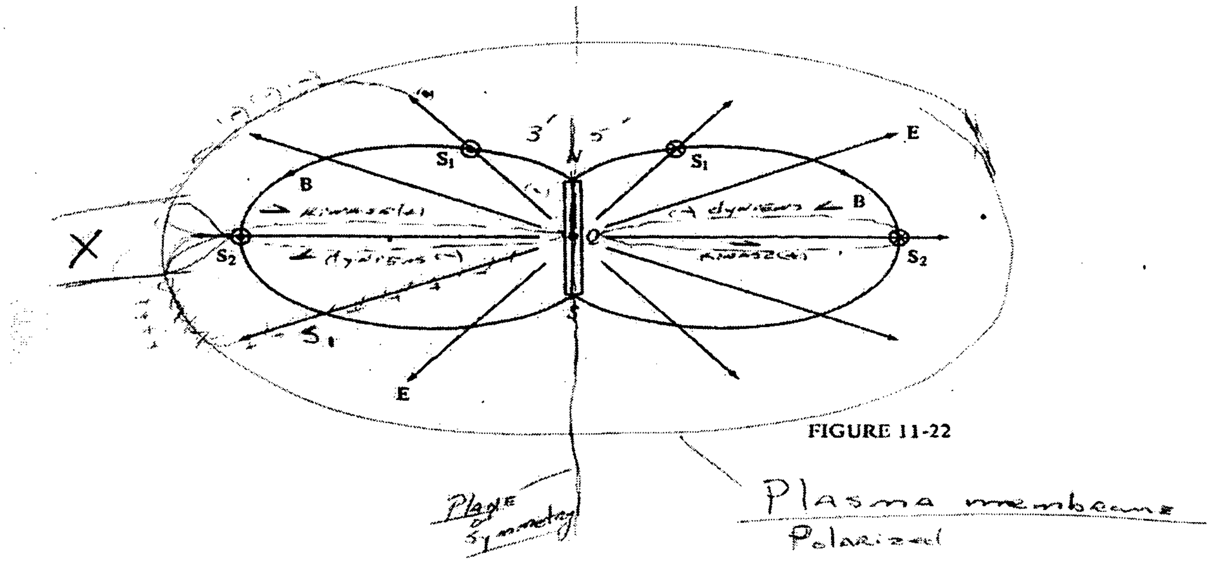


FIGURE 11-22

Q = **Centromere region** kinetochore protein site of single microtubule (positive end) attachment (highly conserved elements).

S2 = **centrosomes** (MTOC) Microtubule organizing center which carry the electrical charge via dyniens (-) and kinesin (+) in diametric opposition about the plane of symmetry

Behind S2 is the stub end of the MTOC, and thus the charge must be splay out. The stub end of the system is the inner wall of the plasma membrane. Thus as the Chromosome move polewardly, the dipole of the system are represented the charges are inversely proportional to the movement of the chromosomes.

Q = microtubules formation assembly from each centrosome (S2) with "opposite polarity" (16pg 920) from two opposite sets of "bipolar spindle" which stabilize one another and push the anti parallel as a "counterbalance". Termed "dynamic instability" displays a proportional *electrodynamic* force.

S2 microtubules which give definition to the middle of the cell (16 pg 790) are "flux machines" and "pulling forces acting on sister kinetochores, are proportional to the length" (3) to which they pull as depicted by the sideway figure eights (next page). This relates directly to the "inverse square of the Coulomb electrostatic interaction" and considers units "per microtubule via electrostatic interaction" p.H. high...due to free Phosphate (3). Herein they are considering the "flux" (17) magnetic component of microtubules directed via chromosome.

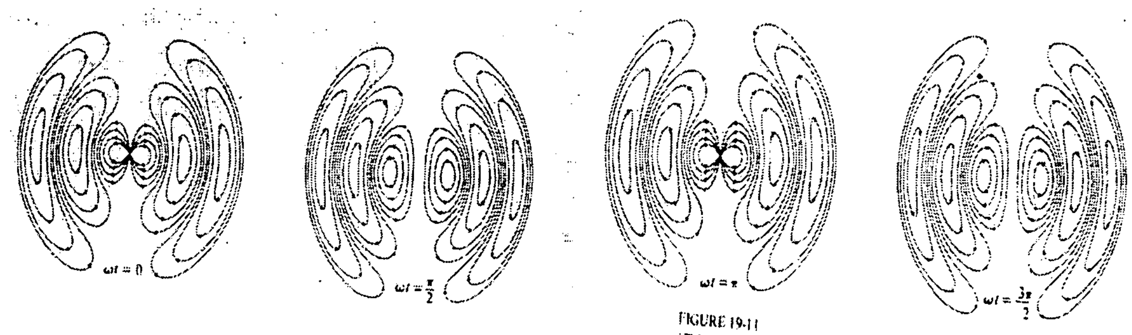
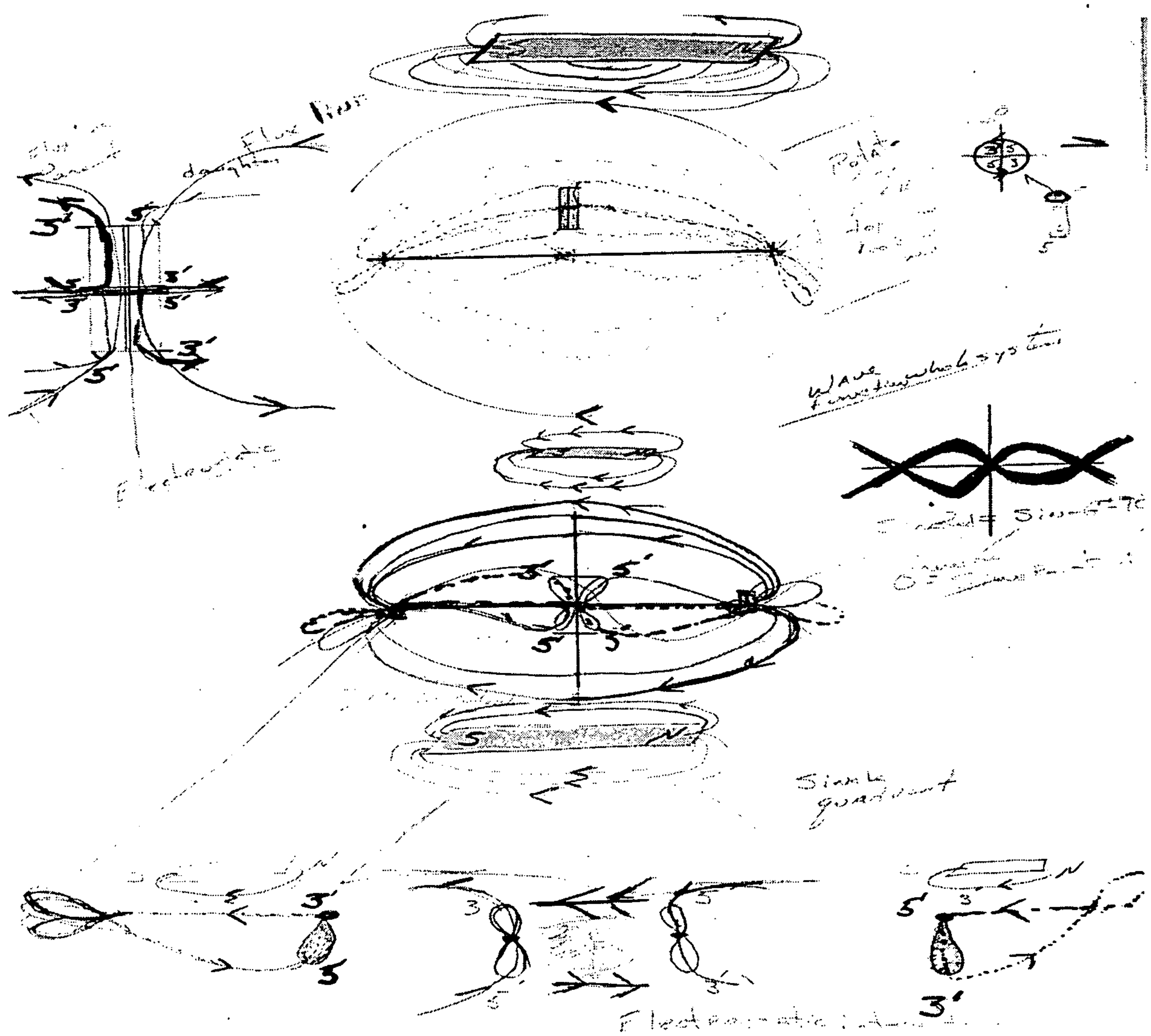


FIGURE 19-11

Depicting cell polarity (15) the oscillating electric dipole flow of energy as at metaphase,

Note that though the fields are static, a dynamic flux of energy is continually transferred about the rings in the magnetic axis. As much energy that is with the system is constant, there is no net transfer of energy it is circulating. "Energy Flux is intimately connected with linear momentum density and this connected with angular momentum" (15 pg423).

Magnetic equilibrium at Metaphase (demonstrates flux lines relative to Magnet)



The cell reaches this component of ordered energy (1T) were it is not chemically nor biologically active, a *bioelectromagnetic field.* ***DNA's' highest ordered state (chromatin) during metaphase substantiates the mechanism***. The forces required to move chromosomes are inverse proportionalities. The plane of symmetry established by the PNCA at kinetochords, equal and opposite in charge, and therefore force as the chromosome themselves.

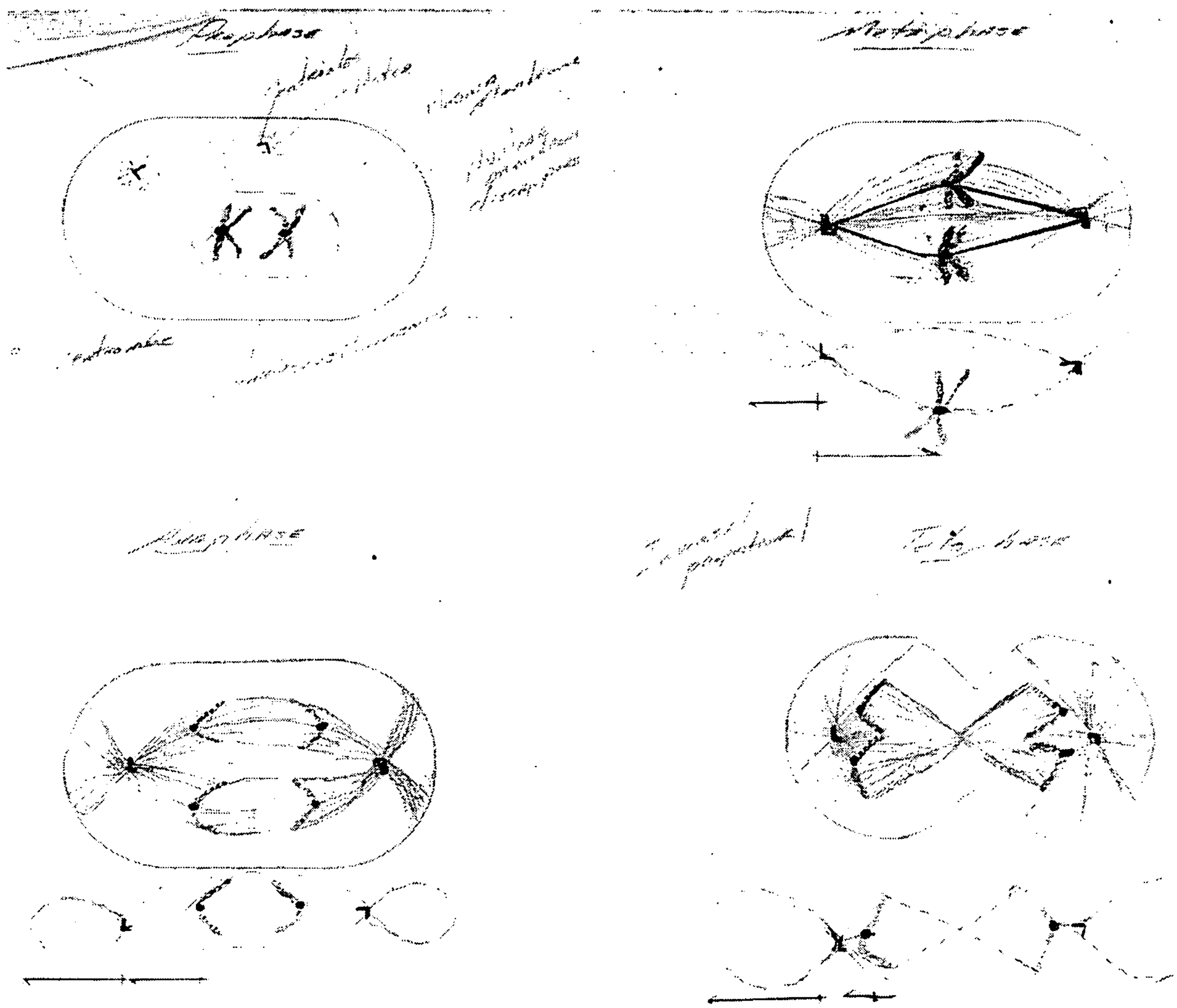
Note: the planes of symmetry within electromagnetic fields. An electrical field inside a spherical shell, Cavendish explains, "force between two charged bodies" such as ((MTOC) microtubules organizing centers), varies exactly as the inverse square of the distance between their centers (daughter chromatids). Due to the diametrically oppose force of DNA replication 5'-3' parent strand to the daughter 3'-5'. In opposition of force of 3'-5' parent replicating 5'-3' daughter. Forces must be equal in size, however be in opposite directions.

Electrodynamical Controls are the focal point of the magnetic lines of force. Possibly as the neutral force forms, van der Waal forces, in the middle of cell it overcomes and breaks the forces of each side right and left. Force varies inversely as the square of distance pulling distance and the new cells

As the net electrical force becomes zero within the chromosome the forces that dominate would be Van der Waal, due to the electron could density of the steric complement of the sister chromosomes at meta phase, and would be the mechanistic forces behind the initial repulsive force, thus propelling the flux machine to operate electrodynamically.

Gibbs free energy equation states that if the *delta G is* zero the system is at equilibrium and no useful work can be done. No (useful) work is done, DNA only directs energy. The direction (bioelectromagnetic field) of energy is essential for cellular life.

Below we see a mechanistic representation of M phase. (prophase, metaphase, anaphase and telophase). The "figure eights" below represent not the electric, but the magnetic (dipole like) component. The attachment forms the motor at (MTOC) and the dynien and kinsiens pull.

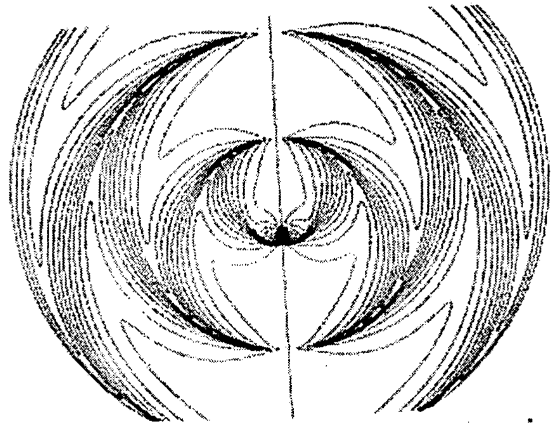


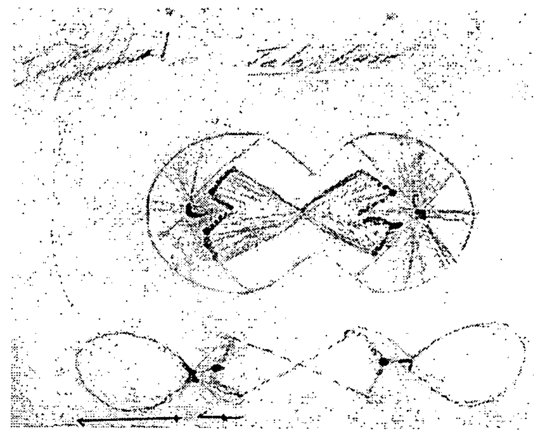
The figure eights show not only the dipole type interaction, but inverse proportionality of the pulling force. *Note: dipole of the side way figure* ***eights*** *(below the diagram) of metaphase anaphase and telophase. Their proportionalities are inversely proportional are to the distance they move from the metaphase plate or line of symmetry.*

The bioelectromagnetic field creates optimum inverse proportionality viewed form metaphase directly to telophase. No field inside a charged shell (cell) can only exist unless if the force between the two charges varies precisely as the inverse square of the distance between centers (plane of symmetry).

As "kinetochore-independent forces on chromosome arms during anaphase"(17) revels that forces (magnetic) are though out the cytosol and controlled.

The simple harmonic motion (15) in an electric field and the striking similarity of the telophase chromosome is depicted.





One can see the displacement of forces as the microtubules pull the chromosomes, via kinechord, toward the centrosome and away from the plane of symmetry that charge, denoted by dipole lines above, increase proportionately to the spherical shell, inner wall of plasma membrane, thus being the (electromagnetic/ electromotive) mechanical force of cytokinesis and cell division.

Ordered Energy and Electrodynamics

"The cell cycle control system is *a cyclic operating biochemical device* constructed from a set of interacting proteins that *induce* and coordinate the essential *downstream process* that duplicate and divides cells content. This is accomplished by a mechanism poorly understood." (16 pg 868).

That there is a hierarchy of cell cycle controls and that a cell is a biological ordered system. The order of the system is covalent linkages via dipole induced electrostatic interactions. The downstream energy favored reactions goes form highest ordered states to lowest ordered states. ***DNA's highest ordered state (chromatin) during metaphase substantiates the mechanism***. Viewing DNA as mediating a charge as simple as a hydrogen bonding, the highest ordered state of DNA is its own capacitance, replication of itself. The energy is stored to full potential with the bonding of all its nucleotides.

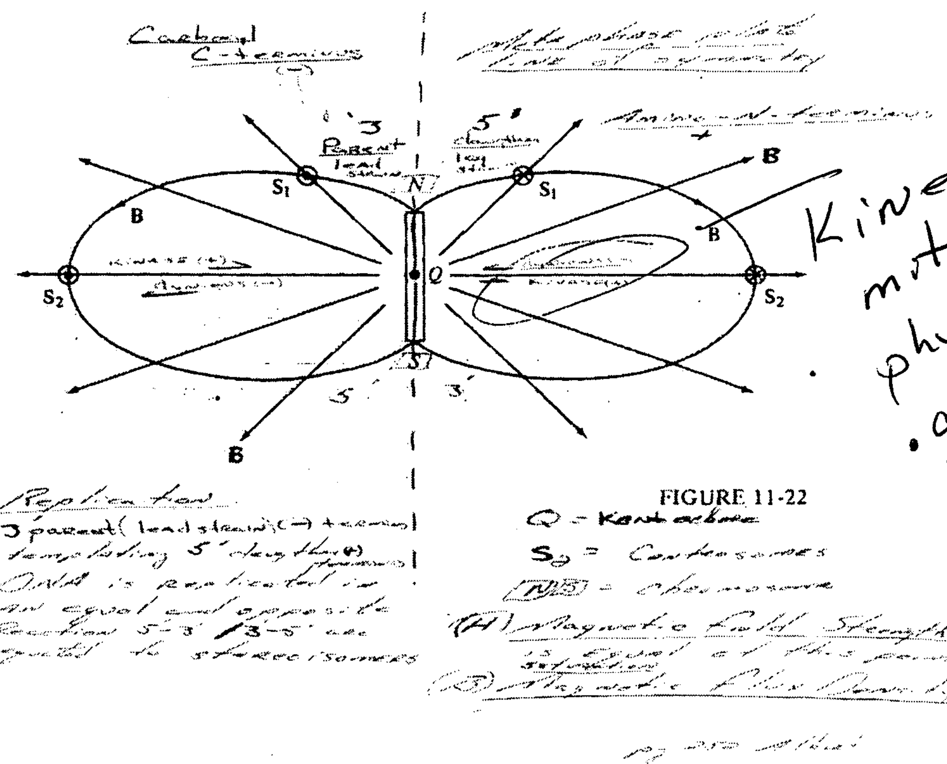


FIGURE 11-22

Kinesin motacs-qw. phys. valberta .ca/mmpd/ jackpaper 3.pdf

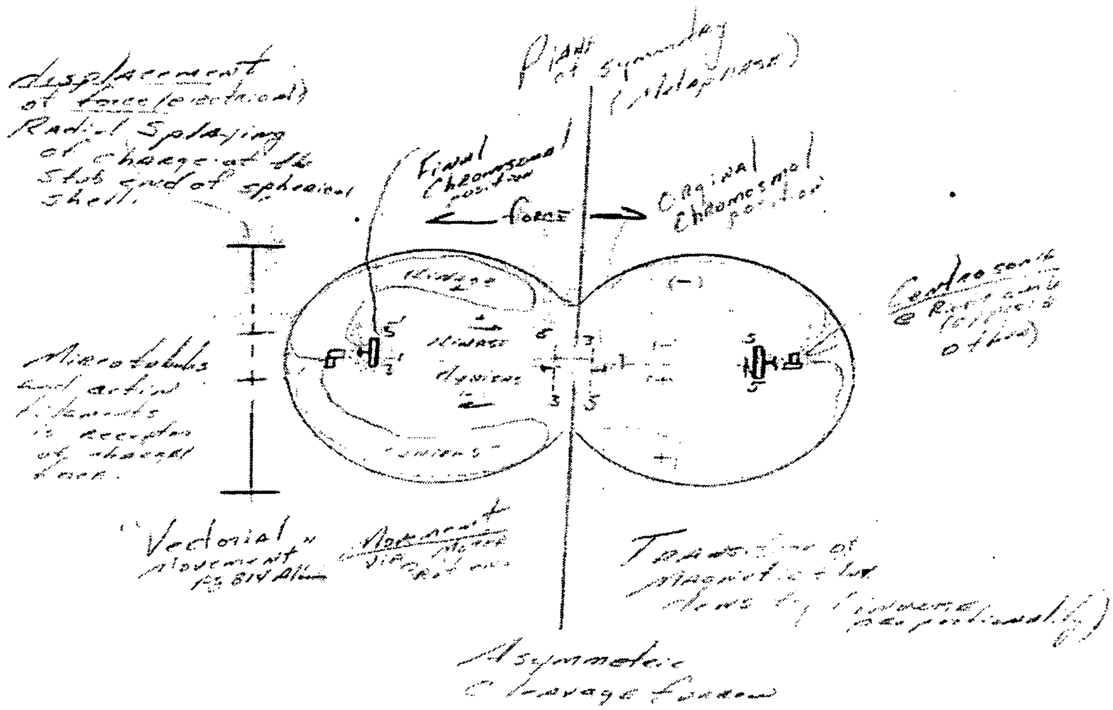
There is flow of electron charge. The amplitude of the charge is always equal and opposite. DNA the bidirectionality of the signal promotes replication (transcription) in a 5' 3' and 3' 5'. Once complete replication ~~one can view~~ electrodynamics due to H bonding of base paring.(see battery) **DNA is functionally held during metaphase in a magnetic field which was created by electromotive force during DNA synthesis.** The downstream energy favored reactions goes from highest ordered state to lowest ordered state.

A comprehensive view of intermolecular forces and the dynamics of potential energy transitions to kinetic biology uses the Nerst equation takes enthalpy (chemical bond) and entropy (free energy changes). Electrochemical gradients, the flow of energy is always down electrochemical potentials, thus being biologically ordered energy.

DNA functionally packaged super coils, are in the highest order state: Chromosomal DNA is functionally held by electromotive force during metaphase. "Condensation occurs because electrostatic interactions dominate entropy, and favored coulombic structure is a charged ordered state" (56) as events lead to this point.

Mechanistically the cell functioning though the rest of M phase displays controls of a bioelectromagnetic field.. Chromosomes, a maximization of coiling to the lowest energy state being "transcriptionally inactive" or (16 pg355) electrostatically inactive "appear to pause" (16 pg 864) are at full capacitance. Metaphase DNA provides genomic stability at the cost of free energy. "Reaching a point of minimization (Chromosomal DNA) of entropy predicted by Deybe-Huckel electrostatic fields which match predicated non linear Poisson Boltzman equations (18) the dominate forces are magnetic.

Electrostatic force is sprayed (upon the plasma membrane) radially at the stub (centrosome) end of a system, but magnetic forces require completion of the either the inducing circuit field lines e.g. bar magnets forces are all equal, and all in equilibrium as in metaphase.



Magnetic equilibrium - Metaphase

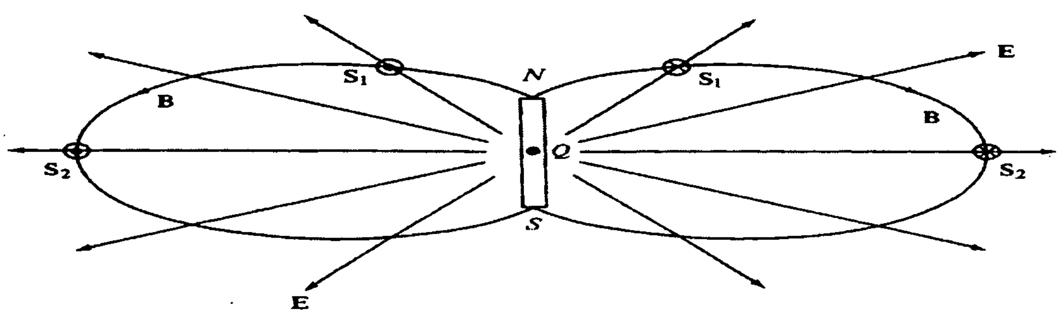


FIGURE 11-22

Is this cyclic operating system biochemical device at this point a battery? With potential DNA base pair hydrogen bonding energy bound in its bonds is its electrostatic forces equilibrate the ordered arrangement of the DNA so precisely oriented to leave the finial energy force as magnetic component. Energy moves down its electrochemical gradient from highest energy of electrical forces to a magnetic (electrostatic component).

An electrical field inside a spherical shell, Cavendish explains force between two charged (Chromosomes) bodies varies exactly as the inverse square of the distance between their centers. There is an electric field inside the cell. Bolton W. Fields expounds that "forces must be equal in size; however, be in opposite directions. No field inside a charged shell (cell) can only exist unless if the force between the two charges varies precisely as the inverse square of the distance between centers (Centrosome). The figure eights show not only the dipole type interaction and inverse proportionality of the pulling, yet we know the work accomplished by microtubules. Having examined the electrostatic magnetic field induced intercellular the dynamic transitions of dephosphorylation to move the chromosomes shows the complete bioelectromagnetic at work. During cytokinesis microtubules acetylates histones HATs.

This view, static and stabilized, as at metaphase perfect ordering of energy and charge (bioelectromagnetic field) producing precise mechanistic response cytokinesis. The DNA at full capacitance must systemically discharge to reconstruct cellular components to proper function as it discharges. Last interaction of DNA is with H1 histones this is the first to dephosphorylation and the DNA capacitance moves from 100% downward. The first ion removed Cl (-) from the cytosol. During mitosis the chromatin electrodynamically is stabilized and overcharged by positively charged histones.

The simplicity of the mechanism shows the complexity of the biological system and the implications of technological advancements of drug discovery, gene therapy how biological cells interact. To answer the question of the controls of the cell cycle - terminology enclosed.

DNA structure functions through electrostatic interaction yields unparalleled explanation of cellular reproduction cell control and cellular response.

Energy harmonizes though the structure of DNA (6). The intrinsic structure of the DNA (4) molecule, in function and structure (5) directs electrochemical energies to intercellular electromagnetic fields (bioelectromagnetic field). DNA orchestrates biochemical synthesis using electrochemical energy creating bioelectromagnetic field directing the cell.

Cell cycle system is a downward spiral of biochemical active phosphorylations (7) balanced by the upward composition of DNA. The mechanisms are discussed, viewing the cell as an electronic structure (1B). The strong correlation of electronics of the cell is expressed as a cavity resonator (8). Extracellular signals from fusion of egg and sperm to growth factors, converts enthalpy (chemical energy) to entropy (free energy) intracellularly. The structure of a cell has structural integrity (tensgerity) based on Buckminster Fuller work (9) gives insight of how this is accomplished, a plasma membrane (10,12) with intracellular compartments the most influential the nucleus (11, 12).

The charge of the chromatin equalize in the cell high ion Na, K+, Ca2+, Mg2+ and H+ equalizing the energy of ATP>ADP>AMP. (Ordered energy) the mitotic cytosol

increasing to a maximum at metaphase were K and OH have highest ordered energy from KOH is responsible for the anabolic active of synthesis. As the introduction of the Cl ion following depolarization of the plasma membrane of ordered energy H+ formation of HCL responsible for the catabolic active of protein synthesis.

The signal transduction pathways are regulated by the nature of (+)n terminus and (-)c terminus and the physical nature of biomolecules such as Amino acids intercellular and extracellular membrane bound intergens. DNA is the most dynamic electrical module within the cell. DNA unique structure and function displays the complexity of bioelectromagnetic fields. Upon completion of transcription and the last hydrogen bond between the last base pairs the overall charge mediated by chromosomes has a net force of zero.

Experiment

Experiment

Hypothesis

Energy harmonizes through the structure of DNA. The intrinsic structure of the DNA molecule, in function and structure, directs electrochemical energies to intercellular electromagnetic fields (bioelectromagnetic field) (4). DNA orchestrates biochemical synthesis using electrochemical energy, creating bioelectromagnetic field which directs the cell. DNA structurally functioning through electrostatic interaction (electrodynamic) yields unparalleled explanation of cellular reproduction, control and response (See Theory).

Ultimate intelligent cellular design, based on a simple cyclical operating system (DNA) electrodynamically highly ordered, creates and functions in a bioelectromagnetic field, directing cellular life through electromagnetic mechanics. There is always symmetry between DNA replication/transcription by balance of charge (magnetic force). *The bioelectromagnetic field is produced intracellularly during replication by the downward spiral of phosphorylations and the upward composition of DNA. The highest ordered state of DNA is chromatin during metaphase which substantiates the bioelectromagnetic mechanism.*

Four elemental ions (Na, K, Ca2+, Mg2+) act in respond to the four bases and their pairing within DNA. Na stabilizes GC and K stabilizes AT. Ca2+ interacts with AT bands and Mg2+ with GC bands. This occurs in highly structured behavior called ordered energy. The cell know to be electronic in nature only though it plasma membrane. Ions always move down their electrochemical gradient. (See Model)

The electrodynamics of the cell function fluxing the capacitance of DNA yields electrochemical gradient and pH changes intracellularly. The change in ion specificity drives molecular motors in the ordered energy systems. The ordered energy system functions of motors are activated by terminus, positive and negative. The specificity of driving the motors is p.H., ion and environment conditions.

The controls of the cell system are electronic. The magnetic component of the electrical system appears minor; however, it is the controlling dynamic. The intrinsic structure of the DNA molecule, in function and structure, directs electrochemical energies to electromagnetic fields (bioelectromagnetic fields). DNA intracellularly orchestrates biochemical synthesis using electrochemical energy creating bioelectromagnetic controlling cellular life.

Objective:

To test this hypothesis one must see (charge meditation) macroscopic change in a microscope (a single cell) environment intracellularly. My theory, based in physics (electrostatics) needed to show a biological system, a single live cell mediating and an electrical charge. Within the cell, pH indictors were used to show electrical activity.

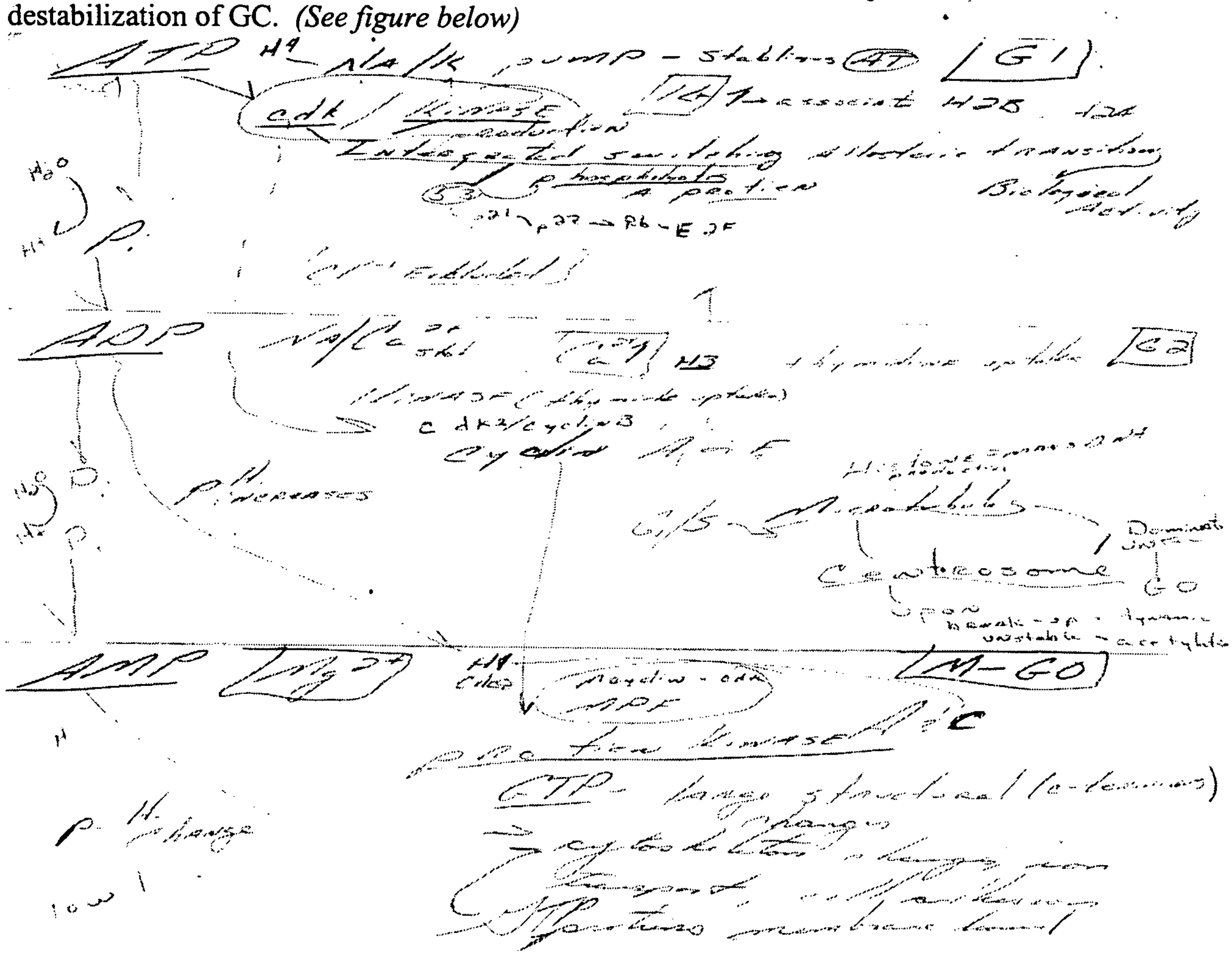
p.H. indicators show color variations H+ (acid) or 0H- (basic) change and have an associated conductance measurement.

Simple system

I used yeast cells, p.H. indicators and salt solutions (ions). This was accomplished by growing eucararyotic (yeast) cells (*saccharomyces cerevisiae)* and staining them with p.H. indicators.
By microscopic analysis p.H. indicators became incorporated into the live cells. Visible structures included the extracellular matrix (halo), plasma membrane, cytosol and nucleus. There appeared color (p.H) changes through out many cells. This demonstrates p.H. (H+, OH-) ion current through one live cell (extracellular matrix, plasma membrane, cytosol and nucleus).

Driving the Na/K Pump

Adding KCL solution to the stained cells, the intention was to drive the Na/K pumps. I observed a two fold increase immediately, of cells progressing though the cell cycle and upon addition of 1M, KCL and p.H. increases intracellularly. The Na/K pump in the plasma membrane uses Pi (ATP>ADP) and stabilization of AT base pairs with DNA and destabilization of GC. *(See figure below)*



This diagram explains the ordered energy of the ion flux and the favored reaction of the electrochemical gradient driving the cell cycle forward.

DNA has structural transitions which change their relative function. The cytosolic environment changes due to ionic current as with NA/K. The pump functions to increase intercellular Pi, drives the cell forward. See below the structural transition of DNA due to ionic current.

clear Ion

POWER

Biologically DNA	Structure	Electric function	DNA	Ions	Cytosol
Double helix	coil	solenoid	AT >>GC	Na, K, Cl	ATP-Cyclin
Beads on a string	coiled coils histone	transformer	GC>>AT	K, Ca	ADP-cdk
Lamp brush	Coiled coiled	Antenna(131)	A> G-Tracts	Ca, Mg	AMP-Cyclin 2- cdk2
Chromatin	Super coils	charged capacitor	Chromatin	Mg	AMP -

Osmolarity study

I performed an osmolarity study comparing the yeast cells (DNA) to sheep blood (no DNA). The cells were place in a sodium chloride solution of 0.0%, 0.85% and 5%. As expected the blood cells appeared normal or crenate respectively in the salt solution. The yeast cell showed relatively no respond to the salt solution.

The osmolarity study shows that the process is not a simple diffusion which leads to the intra cellular role of DNA mediating concentration gradient.

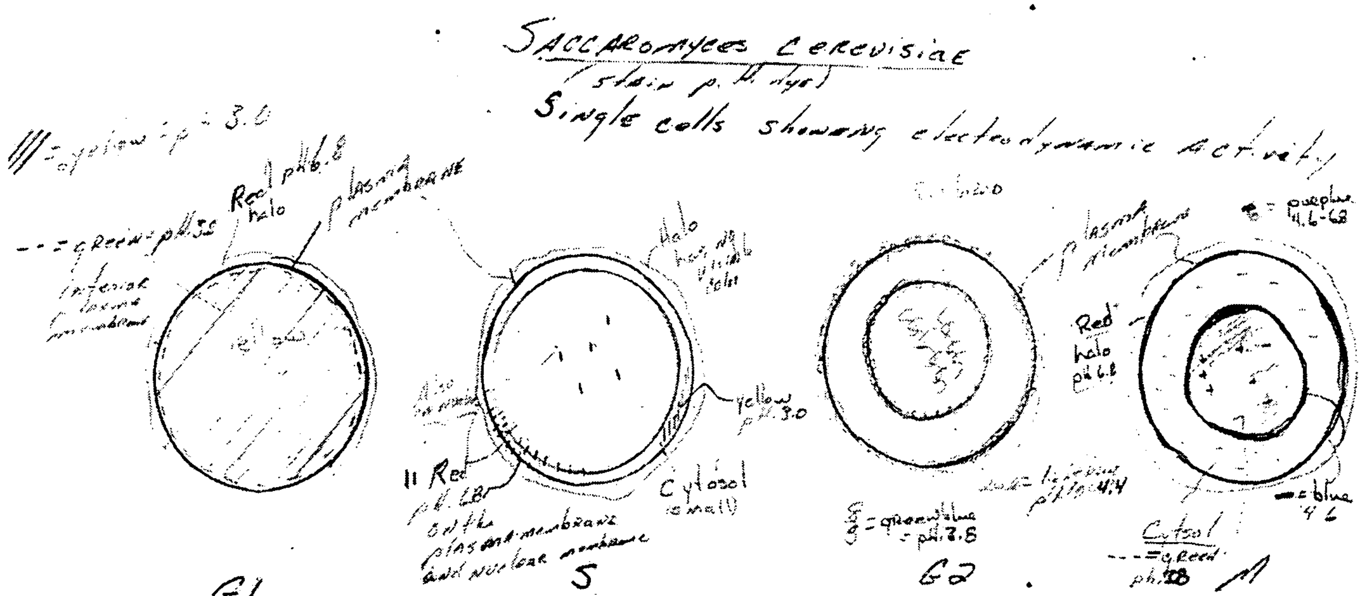
Preface:

Although the experiment was simple it is quite effective in showing a change in a single cell. There was great color (p.H) variation though out the cells which are mainly internal. The changes in color variation are seen around the cell (halo), the plasma membrane, the cytosol, and the nuclear complex. Amazingly the cells up-took the p.H. indicators and appear to function properly.
Manipulations of different indicators took time and believe that they were maximized with the finial indicators that were used. The change in p.H. shown by the indicators intracellularly is vast and leads to thoughts of super conduction.

The cell was effected by the addition of potassium chloride. The sodium potassium pump appear to have been driven; therefore, pushing the cell forward in the cycle. I have video documentation of
the live cells stained and mediating differences of p.H.. As well as being pushed forward with the addition of one molar potassium chloride.

RESULTS:

The results are summarized below in the diagram.



	G1	S	G2	M
Halo	Red pH 6.8	No visible color	Red light pH 6.4	Red pH 6.8
Plasma Membrane	Green pH 3.8	Red pH 6.8	light blue pH 4.4	Blue pH 4.6
Cytosol	Not distinguished	Yellow pH 3.0	No visible color	Green pH 3.8
Nuclear Membrane	Yellow pH 3.0	Red pH 6.8	light blue pH 4.4	Blue pH 4.6
Nucleus	Yellow pH 3.0	Red regions pH 6.8	Green-blue pH 3.8	Purple 4.6-6.8 Noted green pH 3.8 Red pH [illegible]

	Cell cycle	Change G1	of S	intracellular G2	p.H. M	
6.#	Halo around cell	6.8		6.4	6.8	6.67 Ave
4.9	Plasma membrane	3.8	6.8	4.4	4.6	4.9
3.4	Cytosol		3.0		3.8	3.4
4.7	Nuclear membrane	3.0	6.8	4.4	4.6	4.7
5.02	Nucleus	3.8	6.8	3.8	4.6-6.8	5.025

Interphase cells

Cells relatively large vary from pale yellow to blue in color and slightly no nuclear membrane visible. Variations of color indicate intercellular p.H of 3.0 -. 4.6. The appearance of cells in interphase G1 is pale yellow denoting a p.H. 3.0 intracellularly *(no notable cytosol).* Cells stain yellow to green with a halo of red. The major intercellular consistent appear to be the nucleus and mediating a over acidic charge through out. Cells in S phase appear yellow to green blue denoting a >3.8 p.H. *(noting a small cytosol).* There is no color to the halo around the cell, yet note the plasma membrane and the nuclear membrane to be red with yellow color between. Red color from membranes indicates p.H. 6.8. Nucleus stained yellow/green indicating a nuclear p.H. of not >3.8. At times one can note intra nuclear color of red. These colors appear to be DNA. Cells in G2 appear smaller. Outer plasma membrane becomes light blue as does nuclear membrane. The nuclear DNA appears green/blue.

Mitosis

Cells that appear to be in late interphase and the stages of mitosis are very distinct. Their appearance is that of circular paisley. Heavily pigmented blue plasma (p.H.4.6) and nuclear membrane (p.H 4.6 -6.8) cells appear in constant ionic metabolism. The cytosol (p.H. 3.8) being green varying between sea green to near emerald green. The nucleus appears purple (p.H. 4.6 -6.8). Observing the nucleus more closely one can see blues and dark reds (p.H. 6.8) and distinct green (< p.H. 3.8) circles under highly red regions. Red halo around cell noted.

Discussion

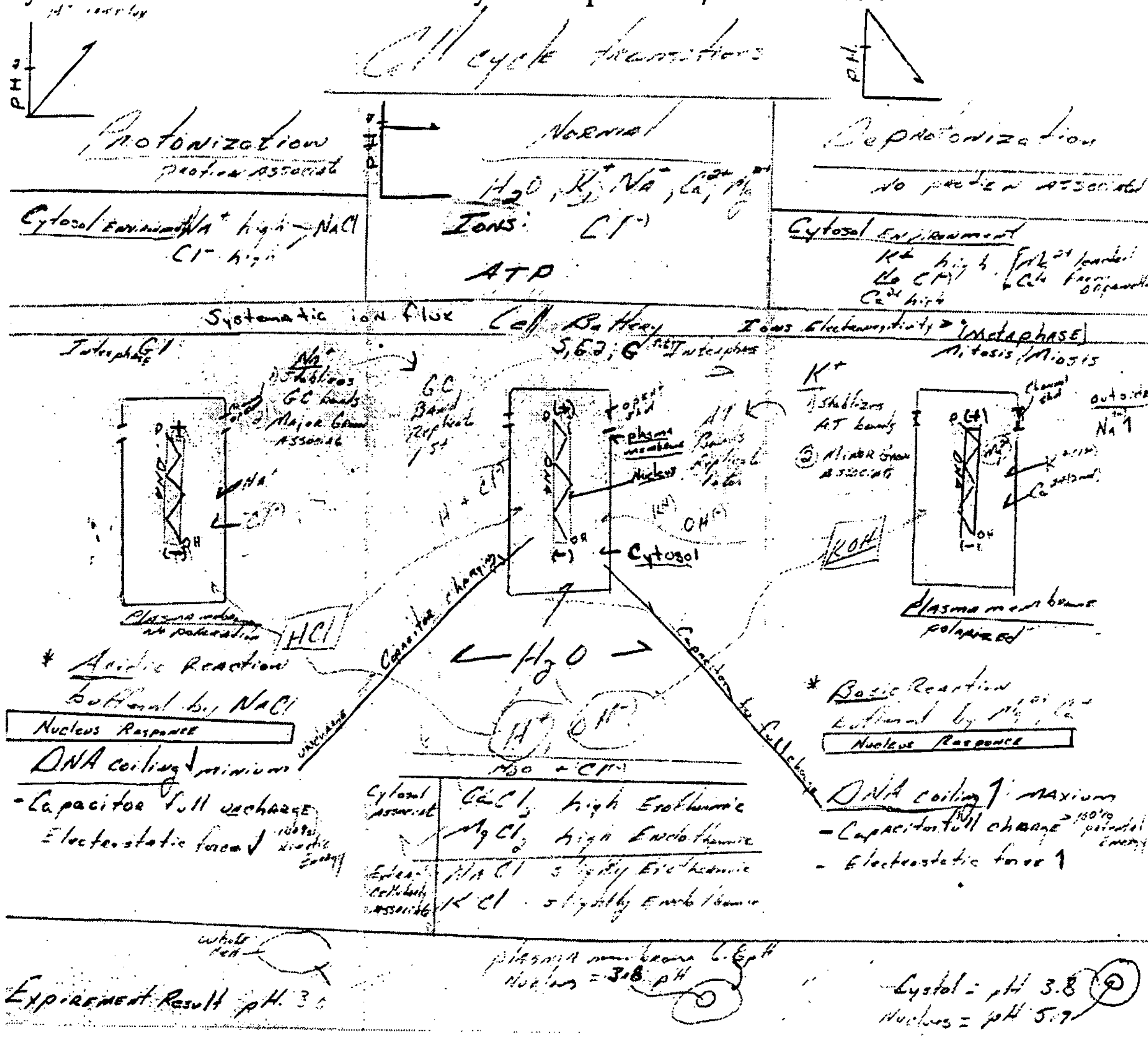
We can review the results in two different ways – gross overall cellular appearance and observed intercellular ion flux.

Overall observational change in ion flux throughout the cell cycle from a p.H. of 3.0 G1 to M mitosis ion differentiation between plasma membranes (cytosol and nuclear) indicating p.H. 4.6 to cytosol p.H 3.8 and nucleus p.H. 6.8

We see three distinct acid/base reactions occurring within and around the cell. A change in color variation suggests undiscernibly Hydrogen bonding. The nucleus staining differentially illustrates the probability of pi stacking interaction of H.

- G1: protonization which corresponds to an acidic reaction
- G2: responding to average cellular response mid point
- Mitotic: deprotonization which corresponded to a basic reaction.

The diagram below show three basic phases G0/G1, S-G2, G2-M. Also change in intercellular p.H. due to ion flux, protein production, "normal ", and no associated protein. The cell is depicted below as a battery. (see battery). The cell cycle can be viewed intracellularly as simple acid / base reactions.



Normal cellular response is at p.H. 7. One can see normal cell activity by the intracellular p.H. to be within normal range of seven, or mediating p.H through structural transitions of DNA. *Variable capacitances can be changed though mechanical means.* Ion flux adjusts to extracellar cell ion concentration as the DNA becomes more or less coiled or meshed. DNA associated with DNA - the more meshed the more the capacitance, the less meshed (coil DNA) the less charge stored or less capacitance. This is dependent on the ion flux and the extracellular signals or ions etc. A static view of DNA as a capacitor, (metaphase) we can say that the capacitance and the resistance are about equal, as the DNA capacitance reaches a maximum. DNA's highest ordered state (chromatin) during metaphase substantiates the mechanism. Yeast differs from other eucaryotic systems in that the nucleus divides the cell in response to the nuclear division. This clearly shows that the nucleus and DNA are responsible for mediating ion flux.

The mechanism of mitosis is understood via electrostatic interaction. To relate the understanding of the electrostatic mechanism a simple formation and deformation of a

magnetic field show the electrostatic dynamically. Therefore I use the term electrodynamic. Electrodynamic controls are highly ordered in a cell. The functioning of a cell shows how the electrodynamical properties are regulated. The nucleus of the cell is the control, comprised mostly of DNA. The structure and the transition of DNA structure are electrodynamic.

Energy is utilized in an ordered way, the same as the cell, as ATP is used to drive the cytosolic reactions. ATP phosphorylates either protein or CDK and Cyclins (CDK and Cyclins are used to regulate DNA reactions). "The bioelectromagnetic field is produced intracellular by the downward spiral of phosphorylation and the upward composition of DNA". Phosphorylations can drive the cell in one of three ways. Phosphorylate a protein in an apoptosis pathway which are self destructive programs. Phosphorylate a protein in need of GO or G1 pathways.

Upon exit of M phase which are dephosphorylation of key histones, which functional pack chromatin. The dephosphorylation occurs in direct opposition as histones were produced and phosphorylated, such as with H1. The winding and packing of the DNA occurs in cell cycle dependent manner and condense. At GO the cell reopens closed ion channels in the plasma membrane. The channels reopen in response to DNA uncoiling. The extracellular environment such as ions, signaling molecules are reintroduced into the cell via voltage gated channels.

The extracellular signals at GO/G1 dictate, via voltage gated channels, how the cell responds. Signaling is highly specific. G1 responds to the needs of the extracellular environment. The choice to move to S phase is dependent on the signals received from the environment. Signaling comes from the environment which includes other cells and not only electrochemical, yet to the bioelectromagnetic fields. The bioelectromagnetic field that DNA is displayed through electrodynamics of cell reproduction, is a new science. How these bioelectromagnetic field relay information signals to other cells, groups of cells, tissues, organs and system is the next step.

The cell responds to the electrodynamics of the bioelectromagnetic field of DNA. The commitment to make protein, answer the needs of structural positional information or reproduce. Bioelectromagnetic fields have the ability to oscillate at frequencies of all EM spectrum and photonic energy. The ability of the science falls with traditional EM spectrum, quantum mechanics and beyond to bioelectromagnetic information.

The process is driven by fluxing the capacitance of the DNA's - AT and GC bands at the cost of ATP>ADP Pi. The plasma membrane controls voltage and Pi by means of the sodium/potassium pump. Internal Pi signals rise to lead the cell into S-phase, intracellularly are cdk and cyclins which function as microchips. Upon entry into the S-Phase the replication of DNA occurs in an ordered energy of AT to GC sequence in a positive to negative direction 3'-5" / 5'-3'. The lagging strain gives rise to an offset of force and keeps the reaction energy favored. While the newly replicated DNA is created most simply by viewing a hydrogen bonding of base pairs, histone production equals the DNA synthesis, thus balancing the DNA with the nucleus. Electrodynamics of DNA replication functions as an electromagnet. The more turns of wire (DNA) upon histone core the stronger the electromagnetic field and electromotive force. This is where the electromagnetic field is created upon replication and increase of electromotive force

(electrodynamics). Upon completion of the final H-bond of base pairs the cells force function to internal G2 signals.

G2 the cell uses divalent cations voltage gating Ca2+ and then Mg2+. The divalent ions interact directly with DNA. That the plasma membrane and the nuclear complex interact directly as though plasma bound intergrins and nuclear bound lamins, yet also though microtubules and MTOC. Microtubules are the sensors of the bioelectromagnetic field show the control of the bioelectromagnetic field as during M phase. They sense the bioelectromagnetic field and use MAP to answer nuclear architectural requirements and provide functional movement of cellular components. Perhaps the most striking motor microtubules form are flagellar motors (16. fig 15-65). The electronic nature of cell will bring forth the greatest scientific understand. G2 phase signals that bioelectromagnetic fields have the greatest ability to oscillate at frequencies of all EM spectrum and photonic energy. The bioelectromagnetic field of DNA lampbrush confirmation could function as antennas. The antennas (loops), oscillate receiving and transmitting signals directly to and from nuclear regions, intracellularly and extracellular, to other cell nucleus within tissue, organs and systems. Bioelectromagnetic field is intensified as the DNA has doubled.

G-2-S Microtubules function to sense the center of the cell and do so perfectly, by their electrodynamic behaviors. The DNA bioelectromagnetic field unitizes it final divalent cation Mg2+, which aids in the movement of GTP and disassembly of tensegritical components such as intermediate filaments and lamins. Electrostatics answers the mechanism of cell ~~division and the~~ electrodynamics answer may signal a pathway to known and unexplored.

Experimental Procedure

Cell preparation

- Cells were prepared by hydrating 1 grams of active dry yeast into 100 milliliters of distilled water and adding 1 gram of dextrose.
- p.H. of cells in solution: 5.9. p.H.
- p.H. of cells determined by fisher probe equilibrated at 7.0 p.H. buffer solution for 48 hours.

Indicator Preparation

- **P.H. Indicator solution:** 30ml of solution B into 10 ml. of solution A
- **Solution A:** 1% aqueous solution of neutral red was obtained.
- **Base indicator:** Neutral red p.H. range 6.8 red - 8.0 yellow.
- **Solution B:** 1% aqueous solution of bromophenol blue was prepared by adding .1 gram bromophenol blue to 100milliliters of distilled water.

- **Acid indicator** Bromophenol blue p.H. range 3.0 yellow-**-4.6 blue
  ** a p.H of 3.8 for green is assumed and verified by p.H. metering.

Ion preparation

- 1 molar solutions: (K) Potassium Chloride, (Na)Sodium chloride, (Mg) Magnesium Chloride,(Ca) Calcium Chloride

Osmolarity study

- Sodium chloride solution of 0.0%, 0.85% and 5%:
- Defibrinated sheep blood.

Cell observation

Cells were observed at ten minute intervals of hydration, one hour interval, 24 hour intervals and once a day for a week. There were no notable changes in the cells. Overall cells were all in various stages of cell cycle.

Cells were stained at a 1:1 ratio (10 mircoliter to 10 mircoliter) with p.H. indicator solution and mixed. Stained cells were placed on a microscope slide and covered with a glass cover slip and observed under 1000x (oil magnification). Cells were in all phases of cell cycle.

Other cellular ions were tested and results will be forth coming.

Microscope modification

- All cells were observed at 1000x oil immersion under a standard white light, 30w halogen lamp. (Blue filter was removed).
- The diaphragm and the condenser were adjusted to maximize light and intensity.
- The fine focus was used to obtain the three dimensional macroscopic color variations. ***Note:*** nucleus, DNA, nucleus plasma membrane, cell plasma membrane, and cytosol.

Osmolarity study

Sodium chloride solution of 0.0%, 0.85% and 5%: was added to stained yeast cell and sheep blood cells (10 micro liters of salt solutions to 10 micro liters of cell type).

Sheep Blood Cell

Results: blood cells within 5 minutes

.0.0 % cells lystic . .85 cells remained normal. 5% cells crenate

Yeast Cell

Results: yeast cells within 5 minutes

.0.0 % cell appear normal. .85 cells remained normal. 5% cells appeared to have slightly high metabolism yet within the ten minutes slowed to normal

Ion test

Addition of KCL solution was to drive the Na/K pumps. I observed a two fold increase immediately, of cells into M phase upon addition of KCL - intercellular p.H. increases.

From these results it appears that the Na/K pumps were driven. Three Na+ molecules are release through the cytosol membrane and two K+ are brought in at the cost of ATP to ADP. We can literally see electrogenics which "tends to create an electrical potential" (16pg 515), driving Na+ out of the cell, the Cl- ion is keep out by the potential of the membrane.

Much like voltage gated cation channels the plasma membrane becomes polarized. As the influx of K+ ions to the cytosol, one imagines the cytosol electrochemical gradient increasing higher and higher + as the plasma membranes blue> p.H. 4.6, cytosol green p.H. 3.8 we see a flux between the membrane and cytosol of p.H 1.2.

Battery

Controls of cell mechanic - BATTERY

All life, in its' most basic form is cellular.

A cell is an electronic structure. Electronic charge causes structural transitions within the cell. The structural transitions are spatial organized in the nucleus to process the signaling network of the plasma membrane though linkages of the hardwired cytoskeleton.

Modeling a cell as a battery facilitates the understanding of cellular electrodynamic properties. The cell function can be shown sensitive to one electron and most clearly viewed as a poynting vector. The DNA is the capacitor of ionic current induced though the plasma membrane gating external ions and signals. Voltage is regulated due to changing capacitance of DNA. The electrodynamic properties of DNA are the structural confirmation of DNA molecule.

There are three basic changes in the cellular battery functioning: electronic charge/ current density controlling intercellular p.H., ordered energy of ion flux, DNA electrodynamics conformational changes.

The" 'design principles', are the magnetic component of DNA, underlying the functioning of such "intracellular networks" (21) include the mechanical behaviors of the cytoskeleton (29) and nuclear envelope.

Static illustrations express dynamic processes (electrodynamics) similar to of a 3-D picture book. The sequential orders of pictures as you flip the pages the illustrations seem to move. I have sequential ordered the events and changes in a cell. The battery (cell) electronic (ion flux) functioning to changes in the capacitor (DNA).

The hardware of the cell is the cytoskeleton and the nuclear envelope. They are connected by microtubules from the nuclear lamina and intergrin cell surface receptors. The software is DNA. Microtubules and centrosome relay signals from intergrins to nuclear membrane. The electricity to run the computer is the plasma membrane Na/K pump. Conduction of electricity signals though ion pores respond to cellular environment.

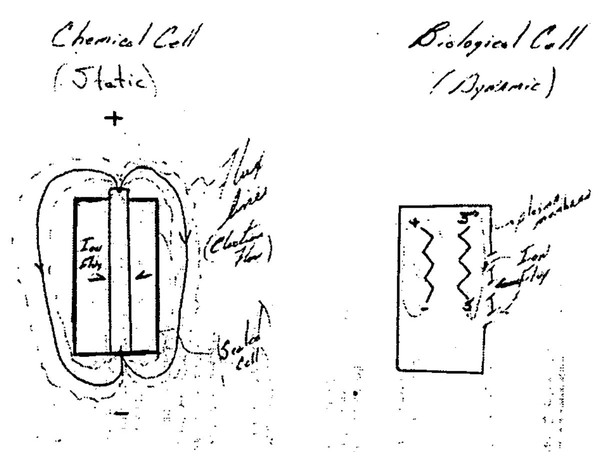
The hardwiring of the cell is the nuclear membrane. Electronic interaction is specific to the structure of the (conductor) or wire (DNA) and the electron movement depicted as single hydrogen electron. The electron moves in ordered energy system p.H. hydrogen bonding transfers uniquely a single electron. The vector depicted as a poynting vector. The electrostatic explain the cell cycle. The symmetry of (electron) energy flux is electromagnetic energy.

"Highly ordered signaling patterns from relatively simple wiring diagrams...leading to the rules of operation" (60).

Battery

The uncomplicated nature of a battery is to give electrons energy. The cell viewed as a battery facilitates the nature of the ordered energy. The metabolic pathways sequester reactions of the cell electron transport chain to an increase affinity for electrons.

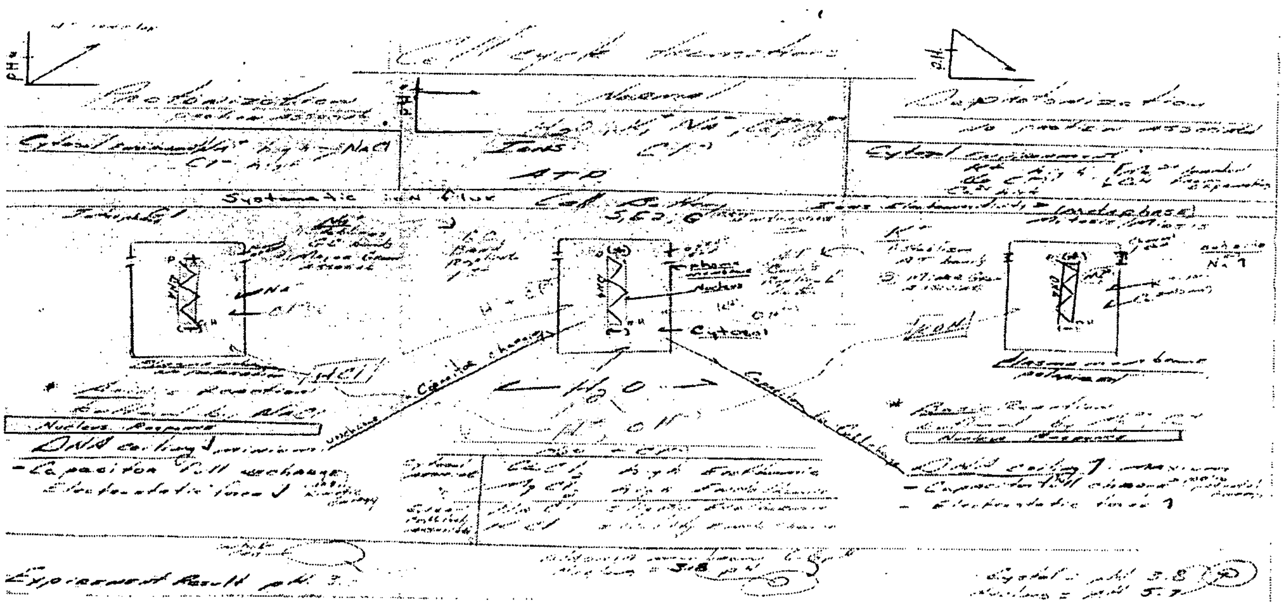
Compare: A Biological cell to a Chemical cell

	***Static Chemical*** Standard battery showing energy flow ***Dynamic Biological*** A cell represented as DNA and plasma membrane. Amino or N- terminus is(+) the 5' end of DNA Carboxyl or C- terminus (-) at the 3' end.

The theory establishes the electrostatic control and magnetic force as the mechanism during M phase of the cell cycle.

p.H. Electron movement

Three ~~static illustrations below~~ derived from experiment and show change in p.H. The mechanism of energy ordered introduction of ions. The cell functions as a battery. The battery functions by single electron hydrogen ion concentration or p.H. The biological battery functions in simplest terms by hydrogen ion concentration or p.H.



The cell responds to extracellular ion concentrations and signals though the plasma membrane. A cell is basically only permeably to five elemental ions (potassium K+, sodium Na+, calcium Ca2+ , magnesium Mg2+ and chloride Cl-) as well as water H2O (H+ OH-). These ions are introduced by their ordered energy. (see expirement)

Vector

The simplest unit a cell exhibits is the simplest functioning of electron flow. Energy flow is always from a positive direction to a negative one, as with a battery or magnetic field, represented here as poynting vector. The flow of charge electron the amplitude charge is equal and opposite.

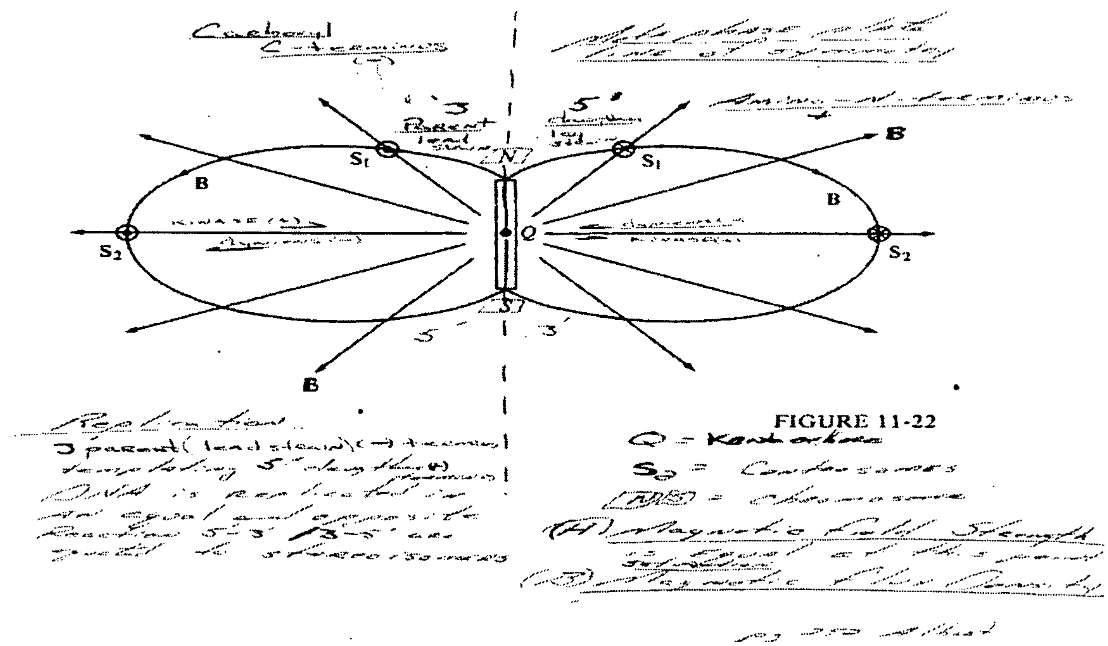


FIGURE 11-22

A Poynting vector (S) electron flows along an equipotent; hence, there is a Poynting S flow of electromagnetic (EM) field energy density (B). The flow of energy is down the positive line and outside it, with reference to the ground return line. The situation is reversed on the ground return line, as DNA being replicated 5'-3' (10). There is a loss less flow of potential energy onto collectors (DNA) (such as the "electron capacitors") provided by the conduction of electrons (101).

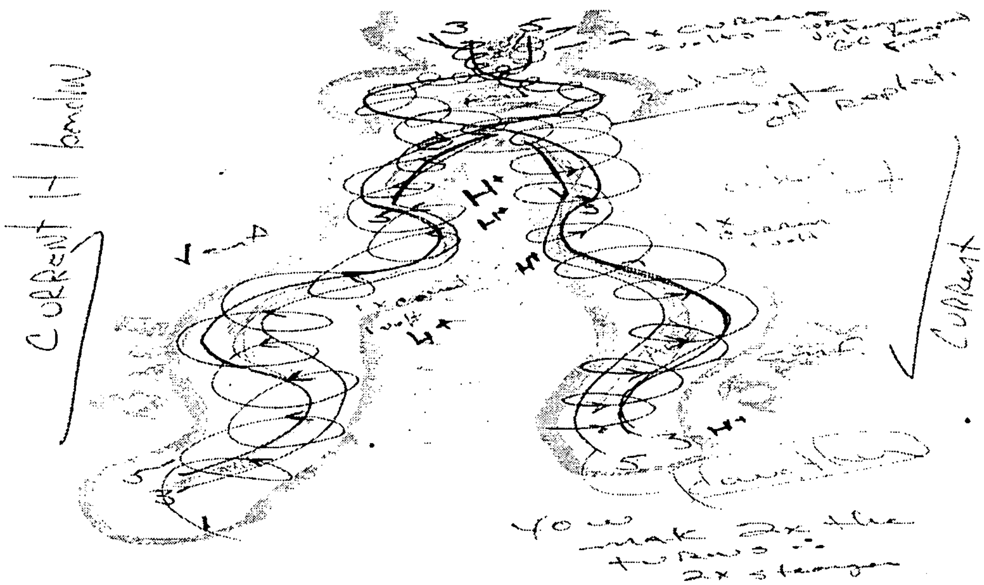
The bidirectionality of the signal promotes replication (transcription) in a 5' 3' (31) and 3' 5' once complete replication due to H bonding of base pairing.

Electromagnetic field energy flows from open to blocked circuit so that an equipotential exists though out the DNA.

The highly negative phosphate back bone of DNA serves as a track or wave guide for electromagnetic energy flow around the backbone that creates a Poynting flux. Simultaneously inside DNA the nucleotides charge due to (electron) Hydrogen-bonding of base pairs and drives conduction current according to Ohms law. The energy flows in

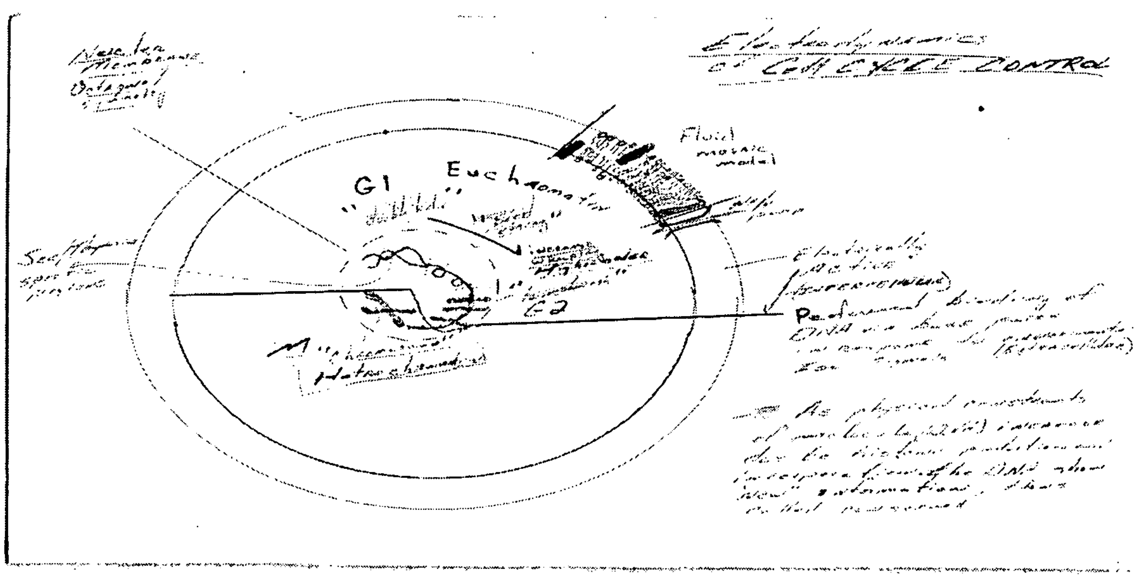
space near the backbone. Upon replication there are leading and lagging strains which lead to the continuous conduction though out the molecule.

DNA conduction during replication.



Complete view of the ordered energy of cell cycle.

The plasma membrane and electrodynamic DNA transition illustrating electrodynamic controls of the nucleus within a cell.



Viewing these illustrations from an electrodynamic (electrostatic) view consider the DNA (solenoid confirmation) or nuclear component, a capacitor.
Confirmations states of DNA viewed electrically.

Conformational States of DNA

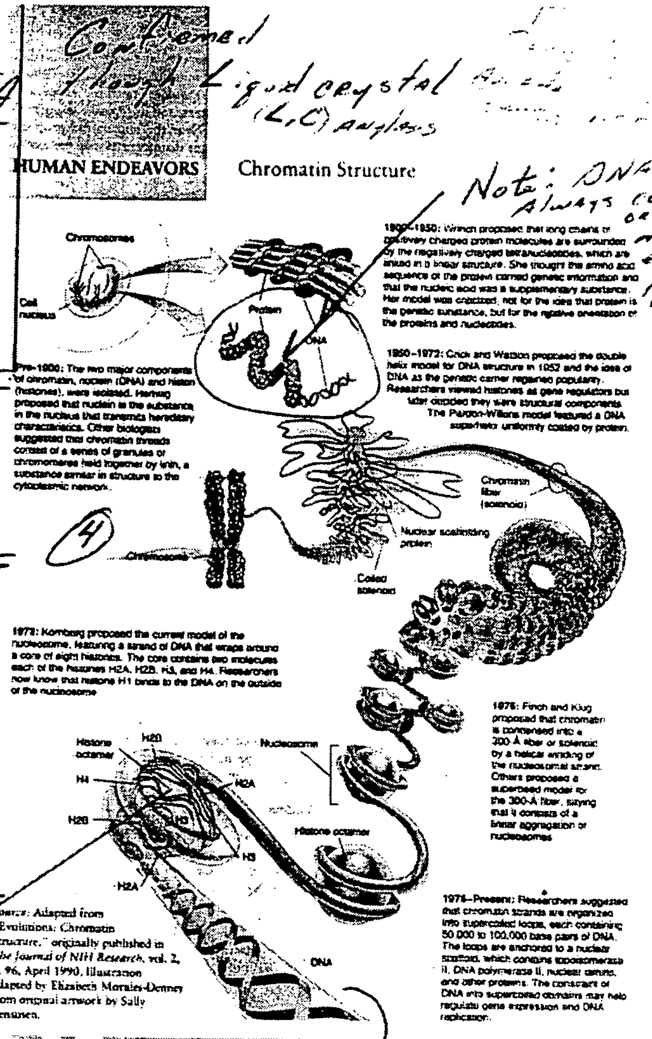
1) "double helix"

2 "Bead on string"

3 Lamp brush

4 Chromosome

Confirmed through Liquid crystal (L,C) analysis



Note: DNA is Always covered or charge mediated but either protein or ...

These Structural transitions All contain Codes in Base Pairs. Every turn proceeds New information Dynamics of the Structural Functioning Code

STRUCTURAL & Functioning Positional Information

Histone

3 Lamp brush Coiled, Coiled

2 "Bead on String" coiled coil Solenoid between Nucleosome functional packing

4

That the super-structure of the Histone octamer from a reductionistic view follows octet rule

1 double helix ... is a solenoid primary

Electromagnet

The electrodynamics of the functional packing of DNA shows (from 1-4) a decrease in the ability of DNA to mediate charge (H-Bonding) free energy yet an increase in structural (dynamic stability). Increase "packing" decrease energy (electron transfer)

That there is a hierarchy of cell cycle controls is a biological ordered energy system. The order of the system is covalent linkages via dipole induced electrostatic interactions.
DNA production and physical properties are expressed by ordered energy reactions due to the electrodynamic properties of DNA. A cell in metaphase shows mechanistically functions of a bioelectromagnetic field.
The establishment of the bioelectromagnetic field explained below though the electrostatic interaction of DNA, functioning electrodynamically, as flux capacitor.

Ultimate design on simple electromagnetic mechanics

First law of thermodynamics states that the total energy in a system must remain constant. Electrodynamical interactions correspond, yet the energy must be converted systemically according to order electrical energy (Bioelectromagnetic field).

The second law of thermodynamics state "system change spontaneously from states of lower probability to states of higher probability." Electrodynamics looks at biological cellular reactions proceeding in a direction that correspond to increasing order of the cell.

DNA stores information by means of hydrogen (H) bonding of bases. (H) Bonding is unique with only one electron, it transfer a single electron. DNA bases are listed as Purines (a 2 ring structure) Guanine and Adenosine, Pyrimidines (1 ring structure) Cytosine and Thymine.

The ordered energy of single nucleotide bases are G >A>C>T and they H-bond in such a way. "Molecular electrostatic potentials (MEP), the energetics of initial guanine oxidation and the consequences of the sequence dependence of DNA structure on electron transport within a DNA duplex." (30). These interaction are base stacking interactions and are independent of the backbone; twist is insensitive to the base stacking interactions (52).

G and C requires' three H bonds and therefore only bond with one another, GC. A and T requires two H bonds, and therefore, bond only with each other AT. GC with 3 H bonds requires an additional H Bond (electron) than AT. AT have a lower energy of activation with 2 H bonds therefore, are favorable with a lower energy requirement (Ordered energy). DNA holding all genetic information in (GC AT) base pairs. The genome can be considering as simple AT and GC sequence. The ordered energy of the genomic information is GC to AT banding, and replicate and function in such a fashion.

Electrodynamics shows the ordered energy of base pairs. "Oxidation occurs preferentially at the 5'-guanine of 5'-GG-3' sites, indicative of base damage by DNA-mediated charge transfer chemistry" (31). There is a variance of electronic control between GC and AT sites "Potential distribution and greater electronegativity of lobes (TATA) in the DNA" (92).

Viewing a step-wise basic utilization of the genome in terms of GC AT bases or the "Surrounding molecular electrostatic potentials (MEP), the energetics of initial guanine oxidation and the consequences of the sequence dependence of DNA structure on electron transport within a DNA duplex."(30).

(MEP) and "DNA-mediated charge transfer chemistry" are most illustrative of the electrodynamics and ordered energy of the mechanistic functionality of DNA in a cell.

DNA

DNA structure minimizes surface area and maximizes the entropy; it's capacitance mediates its electrodynamic environment within a cell (75).

DNA is a double helix (solenoid structure) with complementary base pair, and form 3' carbon to a 5' carbon of the deoxyribose sugar link together by covalent phosphodiester bonds, (53) and its stereo isomer running 5'-3'. The configuration of highly negative phosphate backbone and the H bonding of bases provide a tract of pi-ways for most efficient electron transfer. The high negative phosphate backbone by "histones through electrostatic forces between the negatively charged phosphate groups in the DNA backbone and positively charged amino acids (e.g., lysine and arginine),(and all other "tails") in the histone proteins." Tails are "hypersensitive sites to indicate their extreme sensitivity to enzymatic digestion, typically appear and disappear in patterns that are coordinated with gene activity, i.e., more hypersensitive sites appear as gene activity increases" (69). Histones synthesis, transcriptional regulation, beng precisely timed and conserved equalizes and directs the bioelectromagnetic field.

Ordered energy of the cell due to ionic current of signal transduction integrated by the plasma membrane electrodynamics properties, examination confirmed by patch clamping experiments, shows the use of cellular ordered energy of the ion electronegativity.
(H 2.1> Mg1.2> Ca1.0 >Na 0.9 >K0.8)

Ion flux DNA

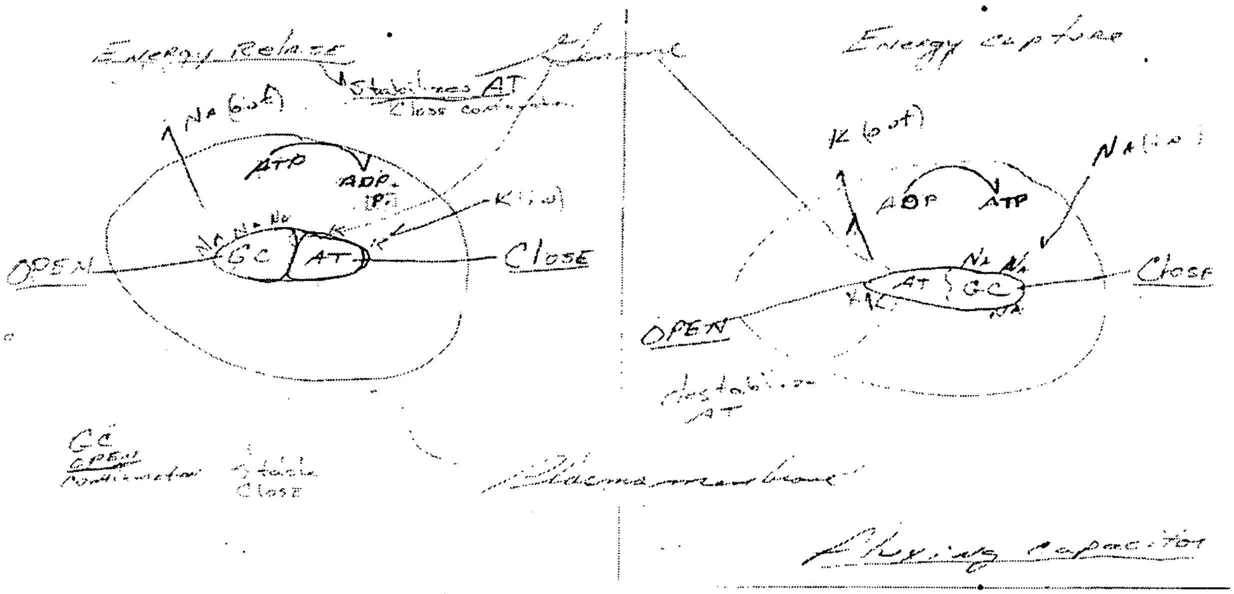
To simplify DNA capacitance controls the (cytosol) intercellular environment induced by extra cellular stimulus. The ion flux though the plasma membrane reacts in an equal and opposite way, thus the fluxing (ion exchange) of the (DNA) capacitor (106). For example:
GC regions are known to be stabilized by NA. AT regions are stabilized by K.

Structural changes in DNA are sequence dependent "GC sequence DNA hairpin but exhibit very distinct affinities for the corresponding AT hairpin oligonucleotide" (75, 93). The "AT-preference of the compounds and provide useful information on their additional interaction with GC sequences sequence-dependent DNA binding properties" (76).

The plasma membrane mediates the flux by the NA/K pump. The flux makes cytosolic energy ATP or use energy ATP>ADP +Pi. The "electroconformational coupling", the applied electric field, induces a shift in the enzyme conformational equilibria through coulombic interaction (79, 80).

The ion flux is in ordered energy and provides stability(24) . The cell using NA/K pump relative to DNA territories GC AT (87) with in the nucleus shows a simple view of energy capture and release. The stabilization of nuclear polar territories(55) that are resultant of ATP flux at the plasma membrane level (12,23,28,64) this the mechanism.

Fluxing the Polar Territories



"The bioelectromagnetic field is produced intracellular by the downward spiral of phosphorylation and the upward composition of DNA.

We know 3 NA go out destabilizing GC and two K come in stabilizing AT bands. Base pairing becomes unstable (electrostatic) and translation occurs. AT "base pairs primarily composing the bridge" (32, 34). AT bands open in response to Na(strophathidan) flux, thus electrodynamically drive the cell towards making protein via opening TATA and move up the electron transfer chain to higher affinity of coding GC regions and make intercellular ATP from ADP.

"A model of G-hopping and AT-tunneling is not sufficient to account for DNA charge transport. Instead these data are viewed mechanistically, as charge transport through the DNA duplex, primarily through hopping among well stacked domains of the helix, defined by DNA sequence and dynamics."(32). ATATA sequences are palindromes, yet differ in function. The bidirectionality during replication or transcription ~~leads to ei~~ther positive or negative roll within the helix (91). Good!

Introduction of K to the cytosolic environment the TATA boxes are stabilized therefore, the less protein to gene activity as the (replication origins) TATA boxed are stabilized. Energy is used as ATP>ADP+Pi. Diametrically opposed this leads to more GC regions open confirmation, as they are destabilized by Na leave the cytosol, creating energy ADP>ATP. "Interaction of unphosphorylated CDK2 with cyclin A serves to configure the active site for ground-state binding of both ATP and the protein substrate, and further aligns ATP in the transition state for phosphoryl transfer."(72).

The polar genomic model, electrodynamic and ordered energy, controls the cell.

GC open to K (cycloheximide) flux and drive the cell

Increasing Na intracellularly there is electrostatic stabilization of GC bands, and destabilization of TATA bands which open calling for synthesis, a switching of on and off due ionic stabilization of DNA. The ordered energy of ionic ($Na^+ > K^+$) related to genomic base pairing GC>AT exhibits the electrodynamics of the cell (24). Guanine (G), which generates guanine radical cations (34) may be responsible for electron transfer.

"Ions always move down their electrochemical gradient". Ions diffuse down there concentration gradient. Ion cellular current to there lowest ordered electrochemical state, $Na^+ > K^+ > Ca^{2+} > Mg^{2+}$ (13,81) as the cell. These ions are responsible "~~inter- and~~ intra intermolecular interactions govern trafficking, distribution, and catalytic capacities of proteins" (80). The electromotive force ATP >ADP driven by the ordered energy of ions (10) moving down their intercellular concentration gradient show there ordered energy. Ions are introduced according to there ordered energies producing internal Pi (7) increase to couple forward regulation the next ion as the first step is the NA/K pump. The Cl^- ion is keep out at this point due to "membrane potential" (16pg.516) and aid in conductance of cations (85).

"Interphase and mitotic cells revealed a cell cycle dynamics of Ca^{2+}, Mg^{2+}, Na^+, and K^+. Direct analytical images showed that all four, but no other cations, were detected on mitotic chromosomes" (13). The fluxing of the capacitance switching of base pair (GC>AT) affinities drives the electrodynamics of the ordered energy within a cell. The fluxing of ions moving down their electrochemical gradient changes internal cellular energy ATP>ADP+Pi transition to a midpoint of electrical energy. The cost energy is as Pi and follows in accordance to ATP>ADP +Pi driving the Na/K pump. Observing the "G1 check point" view as the equilibrium or iso-electric point of charge mediated (capacitance) of DNA base pairs which open AT and leads to GC preferences.

Cyclins

The "Cyclins and cyclin-dependent kinases" (cdk) are "vary modestly during the cell cycle" (27) and are the key regulators of the cell cycle" (23). Cyclins and cdk are the intermediates in the cytosol and function (67) directly in response to Pi (71,72,73,). The "Compartmentalization of protein kinases with substrates is a mechanism that may promote specificity of intracellular phosphorylation events" (74) due to the increase of Pi in the system as "cAMP-responsive Ca^{2+} currents" are intermediate controls in the cell. The "kinases catalyze the phosphoryl transfer of the gamma-phosphate of ATP to the serine, threonine"(71), an output of signaling to serine and threonine of. histone tails which "optimizing the alignment of protein substrates"(72). "Integrated switches" and three distinct inputs two relative positioning of Pi being functional "microchips" (17pg 204) turning on specifically and only once (83). As the Cdk and cyclins operate like a "microchip" so do microtubules. Instead of phosphate inputs they use acetylations and detyrosinations (17 pg811). Cellular constituents are either of internal DNA signals, such as microtubules and histones, which switching occurs by acetylations and detyrosinations

or vice versa. Signals that are extra cellular switch with phosphate inputs and/or dephosphorylation.

Examining cyclins and cdk's in general actual they are intercellular switching mechanism with are transcriptional cell cycle regulated resultant in an equilibrium of synthesis and degradation (23). "5'-triphosphate (ATP) competitive inhibitors of CDK1/cyclin B1 and CDK2/cyclin A" (73). One can see a balance of force related to the cyclin/cdk active, relative to Pi in the ordered energy of ions introduction.

A simple intercellular view

- Na/K...K increases (intracellularly) and ATP = ADP+Pi
- GC bands destabilized produce = Cyclins/cdk
- K (ion ordered energy) = ADP+Pi GC (genomic response) = Cyclins + cdk
- Pi (energy) + cdk (micro process) = Thus drives and increase of the cell cycling
- K = Genomic GC destabilization

As we approach the net 0 (iso electric point) for Na /K conductance (membrane). Net 0 would equate to K being intra cellular highest saturation point (iso electric point). All charges K having been mediated thus saturated. Relating to the GC content there is a balance of K and GC. As K has increase to the iso-electric point with in the nucleus the AT bands have become increasingly stabilized, and since K/Na pump use ATP>ADP+ Pi their maximum of K (electrical conductance) and ADP +Pi. The maximum of Cyclin and cdk synthesized.

Para phasing (16 pg, 667) "Concentration of ATP reaches 0" as called previously, iso-electric point, "that the concentration of ATP depends on ADP+Pi". "That we must look at elementary principles thermodynamics" In no way can these be accurately reflected as thermodynamic as "elementary" they are electrodynamic.

If the Genomic structural information is compromised the phosphate is used to phosphorylate protein such as p53>p21>p27> Rb protein (26). As the case also with cyclin "cyclin D/CDK4 act cooperatively with cyclin E/CDK2 and antagonistically with p57 (KIP2) to regulate the G1/S transition in a cell type highly dependent upon pRb" (101). Alternatively the "transcriptional regulation of cyclin gene expression ensures fine-tuned, continuous changes, and controlled ***proteolysis generates abrupt, irreversible transitions. The progress of the cell cycle is** based on a delicate balance of these mutual, but opposite regulations" (25).*

The cell cycle progresses (or in inhibited) in respond to precise intercellular Phosphorylations. The cell cycle moves forward in response to ordered energy of three key factors: Ions, Phosphorylations and changes in the permeability of the plasma

membrane cell in relation to free energy of the DNA (87). Free energy within DNA is relative to cdk, kinase, and histone production.

Ion introduction: Na+>K+>Ca2+>Mg2+

(Electrical selective conduction thought the plasma membrane)(84). Ion specificity increase phosphorylation carrying molecules decrease with ATP>ADP>AMP. Energy conservation in D hydrogenovorans depends on a proton-translocating ATPase, whereas electron transport appears to be coupled to sodium ion translocation (86).

Phosphorylations are focused on DNA bases phosphorylation: Cyclin and cyclin dependent kinases "microchips" the use of energy and allosteric transition. Simplified when a DNA sequence is used, such as GC there is a compensation of charge. ATP>ADP = Pi which changes the conductance of the plasma membrane. "ATP-sensitive potassium (K (ATP)) channels are bifunctional multimers assembled by an ion conductor and a sulfonylurea receptor (SUR)". Signal transduction through the catalytic module provides a paradigm for channel/enzyme operation and integrates membrane excitability with metabolic cascades (28). Ingber et al (9) seem to completely disregard that "the nucleus play a significant role in the mechanical response of cells". "Integrin cause this mechanical network". That integrin are sensitive to K+ increase as in experiment leads to physical mechanism of action "T cells can be activated and driven to integrin function by a pathway that does not involve any of its specific receptors (i.e., by elevated [K(+)]" (78).

At which point we are left with ADP the ordered energy of ions: Na+>K+>Ca2+>Mg2+, K is maximized Ca/Na pump whose functional similar to NA/K pump. Demonstrating "rise in intracellular Ca2+ are essential second messengers" (23,74,77). The secondary messenger is cdc2 (70,72) and may aid in anchoring "A-kinase Anchoring"(36,74). The activation of the process in terms of the ordered energy has been shown. The high cytosol K+ via voltage gating lead to transduction pathways, trimeric G proteins directly regulate Ion channels. Intergrin and their lamina are physically regulated "IP3 pathways, which directly link to protein kinase C (16pg 746) related to lamina (99) which is discussed later.

The cytoplasmic Na decreases. Thus the Na/K would continue to a point (isoelectric) shut down of the NA/k pump and partial polarization of the plasma membrane were the cell reaches its highest capacitance of cytsolic K and AMP. The electrodynamics phase of DNA changes due the cytosol condition i.e. coils.

The function of DNA is dynamic. It is subject to roll, packing forces, twist and elastic that are sequence dependent (47, 48, 49, 52, 53, 65, 87, 92, 93) which changes the kinetics and structural dynamics in the cell. This changes the highly ordered electrodynamical activity. "Electrostatic interactions between partial atomic charges are most important for C.G base-pairs which are highly polarized leading to strong preferences for positive slide and negative slide conformations in CG and GC steps respectively" (47). (C-G)>(T-A) transition and features of T-G, (87) and comparative

analysis of T-A and A-T steps (91) aid in the understanding of electrodynamics in cell activity. "Transcriptionally competent and active chromatin is confined to a coherent compartment within the nuclear interior, comprises early replicating R-band sequences, leading to the spatial organization of functional nuclear processes" (55).

AT sequences (minor groove associate) and GC sequences (major groove associate) in the ordered energy system in their "packing" associates, Ca within minor and Mg with the major groove (65). Ca and Mg are very specifically distributed due to "electrostatic neutralization and a functional interaction" (13).

Ordered energy of the genomic information in base pair groups function electrodynamically.

GG>GA>**GC**>GT> AG>*AA*>AC>***AT***> **CG**>CA>**CC**>CT> TG>*TA*>TC>***TT***

This becomes linearly expansive to our understanding of genomic information. It is not only expansive to genomic also to the utilization of amino acid codes, protein, and RNA codes. The linear relationship quickly become complex and the contortions are held in a very order way. The energy and electrodynamics are held within field of bioelectromagnetics.

I devised a simple method of evaluating electrodynamic active to explain this linear expansion. This method is simple, yet the need to incorporate terminals such as the 5' and 3'end of DNA and histones tails (96, 97) must be added. I will speak about Terminals + - shortly.

Method of Evaluating Electrodynamics

"Electrostatic interactions between the positive nuclear localization sequence and the poly (Glu) tract, at the C-terminal domain, modulate protein activity and stability"(41).

Take the poly (Glu) tract it Amino acid sequence is GAA or GAG. Turn this into the DNA sequence which is its opposite CTT or CTC. Therefore the poly (Glu) tract in DNA is CTCTCTCTCTCTC. In the ordered energy we know that these tracts would have relatively low energy requirement. These tracts react to a magnetic field to "switches" regulating gene activity. " The nCTCTN sequences apparently act as electromagnetic field response elements (EMRE)" (98). EMRE are downstream to heat shock proteins and show a lower ordered energy requirement.

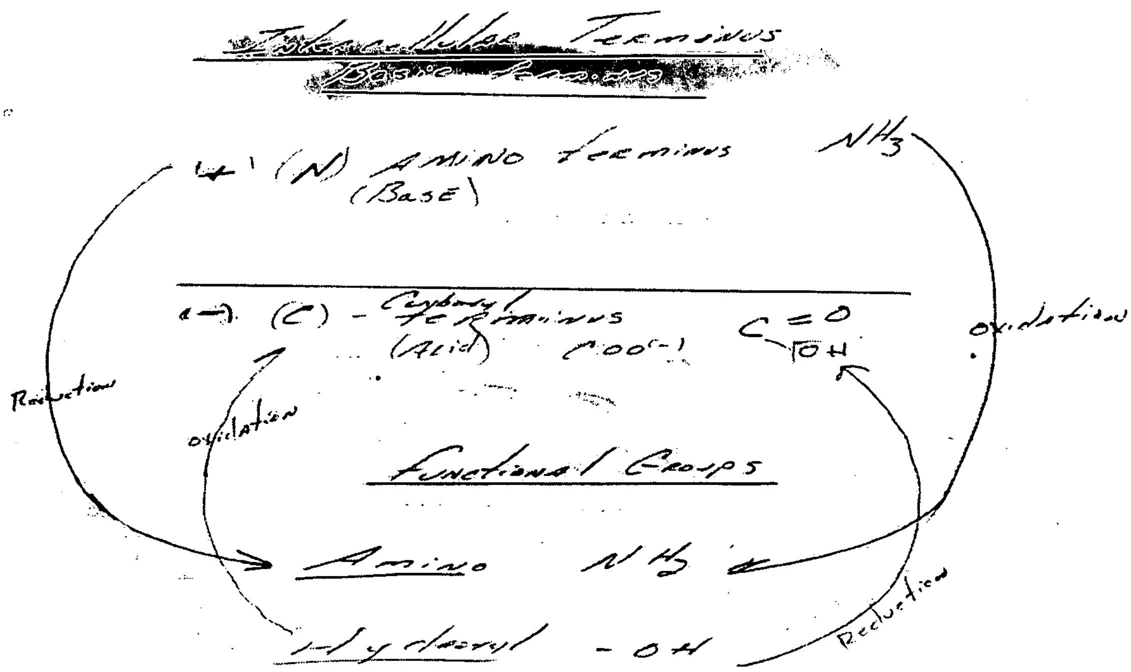
The dynamics of the nuclear code balances shows magnetic type interaction as the low energy requirements of CTCTCTCTC the complement GAGAGAGA has a high energy requirement.

Hydration Favored reactions rates and equilibriums

The solubility of Glutamic acid is 0 zero (insoluble), which means it's not affected by hydration. This is not the case for many of these interactions as most have water favorable reactions. The most common, Serine has a solubility of 422, Threonine 97, Tyrosine 0.5, Arginine 181, and Lysine 6 (CRC).

Cell hydration is another critical element in the evaluation of bioelectromagnetic fields and cell electrodynamic response. Hydrations lead to the activation of tails.simplistically viewed as either oxidations or reductions reactions below.

Hydration of Terminus (tails)



electron transport.

G-proteins, integrin, amino acids, DNA, plasma membrane bound receptor. (GTP bound + Mg2+)

[Acetylations, phosphorylations, methylations]

It is easier to view the whole hydration process as simple single electron transfer (Hydrogen bonding).

As stated previously that p.H dependent structures that are "intercalation topography" are p.H favored (62). That a rise in p.H is easily viewed as water H2O, measurement of H+ relative to (-)OH intracellularly.

C terminus, a carboxylic acid ,(a weak acid) generally react to pH. in basic solution this is a deprotionization as they from a (carboxylate ion) reactive group O- +H3O+.

In acidic conditions they are and acid(protonaztion they from acid) H =H2O... here we see the difference of one H+ ion. When reacted with water we get a hydronium ion H3O+ with high boiling points 141c and addition of a base it becomes a salt.

N terminus an amine (a weak base) generally react to pH basic (deprotinazation they form an amine) reactive group NH_2 and in acidic condition they form a salt. NH_3^+, here we see the difference of one H^+ ion in an opposing direction. When reacted with water a hydroxide ion OH^- low boiling point -6c addition of acid becomes a salt.

"The electromagnetic field is produced intracellular by the downward spiral of phosphorylation and the upward composition of DNA" explains electrodynamically the functional packing of DNA. The plasma membrane literally becomes polarized at this point as balance of charged forces is in equilibrium with chromosomes intracellularly. Therefore, the bioelectromagnetic field must be discharged by the upward spiral of dephosphorylation and the downward decomposition (functional packing) of DNA. The plasma membrane depolarizes as unbalancing of magnetic force.

Variable p.H. conductance and functionality within the cell, controlled by the electrodynamics of DNA structure.

"Biomaterials that are stable and function even in highly acidic, alkaline, hydrophobic, or oxidizing environments" (123) as used in biosensor, yet only the plasma membrane is considered. DNA functions as a magnetoelastic transducer.

"The forces stabilizing intercalated DNA must offset an entropic penalty due to the uptake of protons for cytosine protonation, a neutral pH, and also the electrostatic contribution to the solvation free energy" (89). DNA structure is well known to be sensitive to hydration and ionic strength (88). Experimental observations have shown that indeed the whole cell, DNA and plasma membranes mediate a charge due to change in p.H., due to single ion concentration increase. The DNA codes revels "a strong linear correlation of mobile cations play a key role in local helix deformations" due to electrostatic free energy. The genomic use ordered energy in base pairs are specific in ATP (protein) and CDK (DNA) pathways, as discussed. The internal p.H. of the cell using ions (ordered energy) and the p.H. , maximizes the enzymatic function. This changes the kinetics and structural dynamics of DNA and the cell. Electrodynamics comes into full view. DNA has helical symmetry "concentration and ion strength dependencies are discussed in terms of intermolecular interactions which are considered responsible for the existence of structure in DNA solutions" (49).

These events previously discussed mostly lead up to S Phase. Looking at the whole DNA molecule the "interaction between two stiff parallel DNA" and the "basis of the electrostatic pair potential that takes into account DNA helical symmetry and the amount and distribution of adsorbed counterions" (48) presents the complete understand of the cell.

P.H dependent structures that are "intercalation topography" are p.H favored (62), that a rise in p.H is easily viewed as simply as water (H_2O) measurement of H^+ relative to (-) OH intracellularly.

"DNA hydration, counterion interactions, and average molecular properties, dominate over the local features" (50) as they are electrodynamic. The base stacking interactions

are independent of the backbone twist, is insensitive to the base stacking interactions (52). Considering the "electrostatic interactions by means of the overall electrostatic field" (105) offer insight into the electronic functions. As the ordered energy of our elemental ions (Na, K, Ca Mg) use for "electrostatic neutralization and a functional interaction" (13), "with increasing counterion size while its dependence on the area density of charge of the charged surface exhibits a minimum" (105), the charged surface is DNA (56). "DNA suggests a significant role for the curvature-dependent DNA hydration and counterion interactions, which appear to destabilize nucleosomes", view as "canonical ensemble free energy involved in the competitive nucleosomes reconstitution" (50).

M1-histone complexes were dependent on p.H. and ionic strength, indicating electrostatic interactions (90). All histone production is dependent on p.H. and ionic strength within the cell as are cyclins. The production of all histones is cell cycle dependent. Histones off set the high negative phosphate backbone of DNA and balance the charge. The correlation of histone production and DNA during S phase "Gene profiling of cell cycle progression through S-phase reveals sequential expression of genes required for DNA replication and nucleosome assembly" (102).

The 'design principles', the magnetic component of DNA, underlying the functioning of such "intracellular networks" (21), include the mechanical behaviors of the cytoskeleton (29). The "physical" constraints in the condensation of eucaryotic chromosomes show interconnections. Local concentration of DNA versus linear packing ratio in higher order chromatin structures (81). The plasma membrane becomes hyperpolarized in extracellular cellular p.H. = 8 and Ca+ intracellular is increased which is mediated by K+ conductance (61). The antithesis how the cell functions in the experiment, as this (61) conductance is extracellular we have focused on intercellular.

The induction/repulsion of the Cl ion changes the cytosol environment.(85) The highly negative phosphate backbone compensated by the electrodynamic production and incorporation of histones the Cl ion magnetically introduced to the highly positive cytosolic environment.

The pH component

The signal transduction system for ion flux though the plasma membrane or the intermediate in cytosol are cyclins and or protein production which use of bind the free Pi. The receptors (protein) of the Pi being produced to offset the increase free energy Pi in the cell. Damage to proper pathway "safety switches" (is resultant in protein of an oncogene such as with p53 response and protolytic degragation). The catalytic mechanism of phosporylation of protein kinase is established though electrostatic interactions.

Two possibilities now exist, either the free Pi is used in one of two ways, it either makes protein or drives cdk. "ATP competitive inhibitors of CDK1/cyclin B1 and CDK2/cyclin A"(22, 28, 73, 84). The G2 iso electric point would correspond to high AMP and the

polarization of the membrane. The Ca2+ /Na pump would increase to keep the electrodynamic of + high gradient. ADP>AMP +Pi. A balance would be achieved as cytsolic high + charge would be high due to high K and Ca2+. The affinity for such high + charge to the point of leeching Ca2+ from the sarcoplasmic reticulum (79) and is the mechanism by which it breaks down during cell division. The free Pi in the cell is at its lowest energy and corresponds with introduction of ions Na+>K+>Ca2+>Mg2+, and ATP>ADP>AMP.

NA/K pump responds ATP>ADP and the NA/Ca2+ to ADP>AMP. The architectural changes in the cytoskeleton are due change in ion transports.

G (2)/M phase, suggesting that the activity, as well the localization of the replication competent (RC) complex, might be regulated by specific cyclin/Cdk complex (100). I have shown that for certain they do and that an ion contribution has been overlooked. These are transduction pathways shown by the ether a go-go "effects of Ca2+ on Human ether-a-go-go-related gene current amplitude and kinetics" have distinct voltage-sensing mechanisms" (77).

G2-M

The dynamical interplay between the cytoskeleton geometry and the kinetics of biochemical reactions, include gene activation (107), which are regulated by the electrodynamics of DNA. and structural changes

"G2/M phase is not simply due to enhanced permeabilization, but reinforce the statement that the melting of the nuclear membrane facilitates direct access of plasmid DNA to the nucleus". That electrostatic ionic flux though the plasma membrane and structural transitional changes in the DNA have been shown (24, 105). The G2/ transition show the greatest change in tensegrity. That it is an actual electronic response via the DNA and the plasma membrane has not, exception would be the experiment, that early in GO/G1 show ~~a relationship between extracellular K+ change voltage-gating, specifically with intergrins (78), that voltage sensors~~ (77), change with ion introduction and ATP signals (64). "P ~~Feedback control of the ATP-sensitive K (+) current~~ by cytosolic Ca(2+) contributes to oscillations of the membrane"(84). due to distinctive higher-order chromatin structure at mammalian centromers (95).

G1
S
G2/M

Biologically DNA	**Structure**	**Electric function**	**DNA**	**Ions**	**Cytosol**
Double helix	coil	solenoid	AT >>GC	Na, K, Cl	ATP-Cyclin
Beads on a string	coiled coils histone	transformer	GC>>AT	K, Ca	ADP-cdk
Lamp brush	Coiled coiled	Antenna(131)	A> G-Tracts	Ca, Mg	AMP-Cyclin 2- cdk2
Chromatin	Super coils	charged capacitor	Chromatin	Mg	AMP -

Computational

That "cytoskeletonal interactions might affect the electrophysiological changes observed during the cell cycle" (43). *Ion channels interaction with plasma membrane structural components at intergrins reorganization of the cytoskeleton during the G2/M transition. (43).* These are "electrostatic interactions between C2 domains of known structure and phospholipid membranes" (42), as with Ca. The key component is surface-to-cytoskeleton laminin produce forces exclusively local responses by both the actin and microtubule cytoskeleton (29) mechanisms through which this plasma membrane enzyme communicates with the nucleus (23) signaling centered on the functional association of integrin receptors with ion channels (12).

G2M

As the G-2–M transition begins laminin with in, the nuclear membrane become phosphorylate and begins to disassemble the membrane. ~~Intergrins~~ within the plasma membrane become destabilized also. Intergrins in ~~the plasma~~ membrane are sequestered in the ordered energy of Ca>Mg ion flux. The tensegrity of the cytoskeleton changes (99). The change in the cells' cytoskeleton architecture is due to iso electric point of the G2-M transition of the Ca to Mg ~~ion transition~~. Ultimately tensegrity of the cytoskeleton and the nuclear membrane are directly in equilibrium. The equilibrium of the nucleus and plasma ~~membrane function mechanically though~~ ion specificity inducting structural architectural change. *The change is the cytoskeleton ~~architecture~~, tensegrity react to the electrostatic properties of the internal ionic environment. Especially due to high Mg and Amp levels which are consequence of the polar territories of the chromosomes (9, 13, 24, 39,55,57,58, 81).*

AMP and Mg2+ are well establish spermide mechanisms "pCDK2/cyclin A in the presence of Mg(2+)ADP"(71).

M - GO

functions ally

DNA, structural functioning electrodynamic, cellular behavior confined by the cells' (extracellular matrix and constituent ionic environment) structural positional information. "5'- or 3'-end; this labeling difference corresponds, in the absence of charge neutralization by condensed counterions, to a shift in negative charge from one end of the duplex to the other" (31). The bioelectromagnetic field, that DNA ~~displayed~~ though electrodynamics of cell reproduction is a new ~~science~~. How these bioelectromagnetic ~~fields relay~~ information is by signals to other cells, groups of cells, tissues, organs and system. The cell responds to the electrodynamics of the bioelectromagnetic field of DNA. The commitment to make protein, answer the needs of structural positional information or reproduce. Bioelectromagnetic fields have the ability to oscillate at frequencies of all EM spectrum and photonic energy, traditional EM spectrum, quantum mechanical and beyond. Charge and weight ~~of DNA become resolved~~ as capacity equates to the number of electrostatic ~~forces~~. (94)

(BIO)ELECTROMAGNETIC

The intrinsic structure of the DNA molecule, in structure and function, directs electrochemical energies to electromagnetic fields (bioelectromagnetic fields). DNA intracellularly orchestrates biochemical synthesis using electrochemical energy creating bioelectromagnetic field directing intercellular constituents. DNA can function as a superconductor.

Biosynthesis is a chemical catalysis that is autocatalytic mechanism possessing a behavioral relationship. The behavioral relationship is a DNA electromagnetic capability, which creates the ordered energy ion introduced intracellularly energized by the voltage gating of the plasma membrane.

Using DNA replication during S phase and relating it directly to electromagnetism one see the mechanism. Review of the physics comes partly from reference (108, 109, 110).

When a current-carrying wire (*DNA*) is wound into a number of loops (*helix turn helix*) to form a coil, the resulting magnetic field is the sum of all the single looped magnetic fields added together. *The current carrying wire DNA can be viewed also as beads on string or lampbrush.* This arrangement is similar to several conductors lying side by side carrying current in the same direction.. With the lines of force leaving the coil at one end and entering at the other end, a north and south pole are formed at the coil ends the same as in a bar magnet *(poynt vector).* If the current direction through the coil is reversed, the polarity of the coil ends will also reverse. *The direction of current flow is equal and opposite in DNA replication as 5' parent to 3' daughter and 3' parent to 5' daughter, therefore, it is bi-directional. DNA there is a lead and a lag strain,*

When a coil *(DNA)* is wound over a core of magnetic material such as soft iron (*Histone*), the assembly becomes a usable electromagnet. *Beads on string, bound functionally packed DNA, the beads must have electromagnetic component.* The strength of the magnetic field at the N and S poles is increased greatly by the addition of the soft iron core. The reason for this increase is that air is a very poor conductor (*cytosolic environment and microtubules reacting in the field)* of magnetic lines, and iron is a very good conductor. The use of soft iron in a magnetic path will increase the magnetic strength by about 2,500 times over that of air. *As replication and histone production increases the field strength increases.* The strength of the magnetic poles in an electromagnet is directly proportional (*as Histone production*) to the number of turns of wire *(DNA)* and the current in amperes flowing in the coil*(DNA)*. You create twice the magnetic field strength upon replication. The more the DNA is packed or turned the less current is need to keep the same strength.

An electromagnet having one ampere flowing through 1,000 turns = DNA with one ampere flowing though 1000 turns (lampbrush)

, 000 amp

EQUALS *carries the same charge as:*

- *Electromagnet having 10 amperes, flowing through 100 turns, will each create 1,000 ampere-turns.*

- *DNA (bead on string) with 10 amperes, flowing though 100 turn (bead on string) = the 1,000 amperes per turn.*

The charge around the wire due to turn the more turns the less current need to create the same field. The more DNA is coiled the less charge it needs to keep field strength. This is a measure of the magnetic field strength (*the electrophoretic properties of DNA show charge and weight resolution (94). Charge and weight have to do with the functional packing of DNA "mobility similar to that observed for high molecular weight chromatin". Compact chromatin structure of nucleosomes the "fragments of higher molecular weight show similar electrophoretic properties because they become very compact in the presence of Mg2+ and form cylindrical structures" (94). The conduction of current with more turns of DNA needs less electron flow.* The attraction on magnetic materials located in the magnetic field of each of these electromagnets will be the same.

"Based on the hypothesis that nucleosome stability mainly depends on the bending and twisting elastic energy to transform the DNA intrinsic superstructure into the nucleosomal structure. The ensemble average free energy, is calculated starting from the intrinsic curvature" (50).

"Electric and magnetic fields of a uniform plane wave propagating in the z-direction".
The fields are mutually orthogonal, and orthogonal to the direction of propagation. In fact, rigorously the EM energy flowing "in" an electrical circuit does not flow through the wire, but outside". The charge on the surface of the wire provides two types of electric field. The charges provide the field inside the wire that drives the conduction current according to Ohm's law. ~~Simultaneously, the charge provides a field outside the wire that~~ creates a Poynting flux (109). The wire serves as a sort of waveguide or railroad track for the energy flow outside.

DNA has the functional capability to work as a magnetoelastic transducers. "The magnetoelastic transducers are suitable to be used for a measuring force, moment and pressure, respectively, primarily under extremely heavy environmental conditions
(high operating temperature, aggressive chemical pollution, intensive electromagnetic interference, vibration etc.)" (117).

Mircotubules

The equilibrium of the nucleus and plasma membrane function mechanically though ion specificity inducting structural architectural change. These changes are regulated and connected by microtubules. Microtubules feel and react to the bioelectromagnetic field. Microtubules sensors of magnetic field and react in a dynamic equilibrium. They can transport charge (111,112,116) and signals directly though MAP. If the bioelectromagnetic field is disrupted with drugs (taxol etc.) the cell dies (114, 115). The field and the maintenance of the field is critically important in cell function. "Radial MT array" are not "self-organization" they are directed by the DNA bioelectromagnetic field in a dipole manner as with their "minus-end-directed". "MT motor" are driven by

electronic conduction and the resultant field DNA in the nucleus (111). Interaction based on physical constraint "This work can be used for description of the electrostatics of the thin cylindrical structures in biological systems such as DNA, protein macromolecules and charged micro and nano tubes" (105).

The complete picture of a cell functions are due to (PSFI) (1T with the system

Plasma Membrane/Extracellular Environment

The plasma membrane is electrogenic (Albert et al. pg 515) (Electrodynamic) and allows ions to cross down their electrochemical gradients (OE) is well established. Although, voltage gating of the lipid bilayer functions uniquely to "electrically excitable cells'" (9), such as nerve cells; nevertheless, "electrically excitable cells'" have the same DNA as all other cells in a system only differing in their positional structural functioning information (PSFI). These are established though "transduction cascades" and "mechanical forces in extracellular matrix receptors such as intergrins and cytoskeleton" (8). The cytoskeleton provides structure, movement, and communication also tensegrity (8), (structural integrity). Tensgrity models equate to buckie ball. Microtubules and actin filaments are polarized structures and functional dependent on polarity. Intermdiate filament are the weaved basket of the plasma membrane and also the nuclear lamina the higly structured componets can be broken down during mitosis by phosphorylation of key serines.

All cells have the potential to be electrically excitable, in fact, **all cells are electrically excitable (OE and electrodynamic).** *Note: that there is no explanation of how and why the plasma membrane is electrogenic the understanding of DNAs' electronic nature answers the (OE) of its functioning.*

Extracellular Environment

A cell answers its extracellular environment with respect to the cells' positional structural functioning information (PSFI). A liver, neuron, skin, any cell functions due to extracellular matrix the signals (ion etc) it receives via plasma membrane and extracellular matrix. Stem cells have not been established to their (PSFI), therefore are omnipotent.

Cytosol

Mitotic cells revealed a cell cycle dynamics of Ca2+, Mg2+, Na+, and K+.(10)
Considering the DNA electric receptor of the cell, the extra cellular environment commands signals and ion specificity to (PSFI). The way in which the ions, signals, etc cross the plasma membrane illicit an intercellular response, such as ATP – ADP - NA/ K pump and regulate cytosolic p.H in (OE and PSFI) therefore, electrodynamically. The nucleus acts in response to the ion specificity of the cystol(OE)and electrodynamically.

Nucleus

The importing and exporting of protein and RNA's, traffic between nucleus and cytosol. The nuclear pore complex, an octagonal symmetry, and varying size 9-26nm gating properties, can be explained by bioelectromagnetic interaction. The molecular basis of

transport operation in and out of nucleus will be explained in terms of bioelectromagnetic field. *Note: fibril outside and nuclear cage inside appears a speaker structure.*

Cytoskeleton

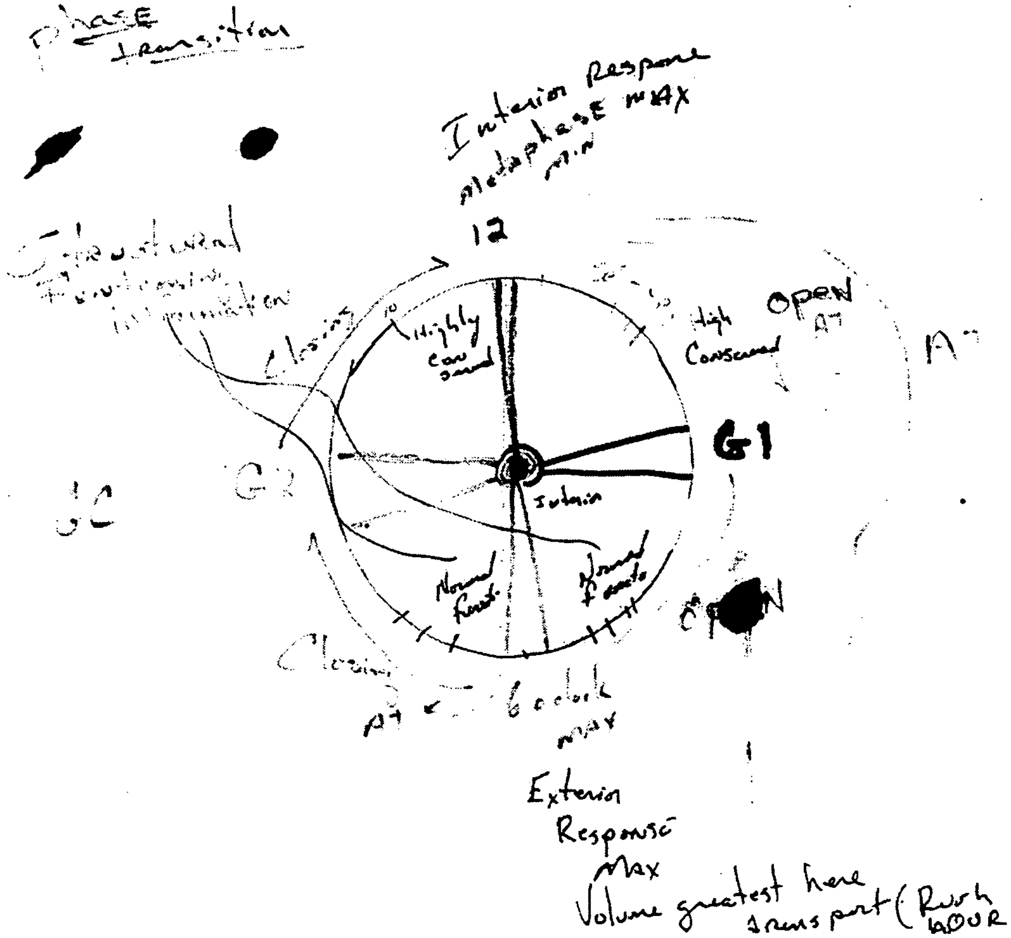
The cytoskeleton provides structure, movement, and communication also tensegrity (structural integrity). Tensegrity models equate to buckie ball. Microtubules and actin filaments are polarized structures and functional dependent on polarity. Intermediate filaments are the "weaved basket" of the plasma membrane and also the nuclear lamina. The highly structured components can be broken down during mitosis by phosphorylation of key serines and tyrosines.

Metaphase chromosomes at the point were all charges (H) within the DNA mediated at it maximum compactness it is at full capacitance and is transcriptional inactive. No more charge can be held. The plasma membrane is polarized. Here we see chromosome that appear trapped in a biomagnetic field. The sysnthesis as we know of DNA is 5'-3' and asymmetrical about the **metaphase axis** converservely the other strain 3-5.

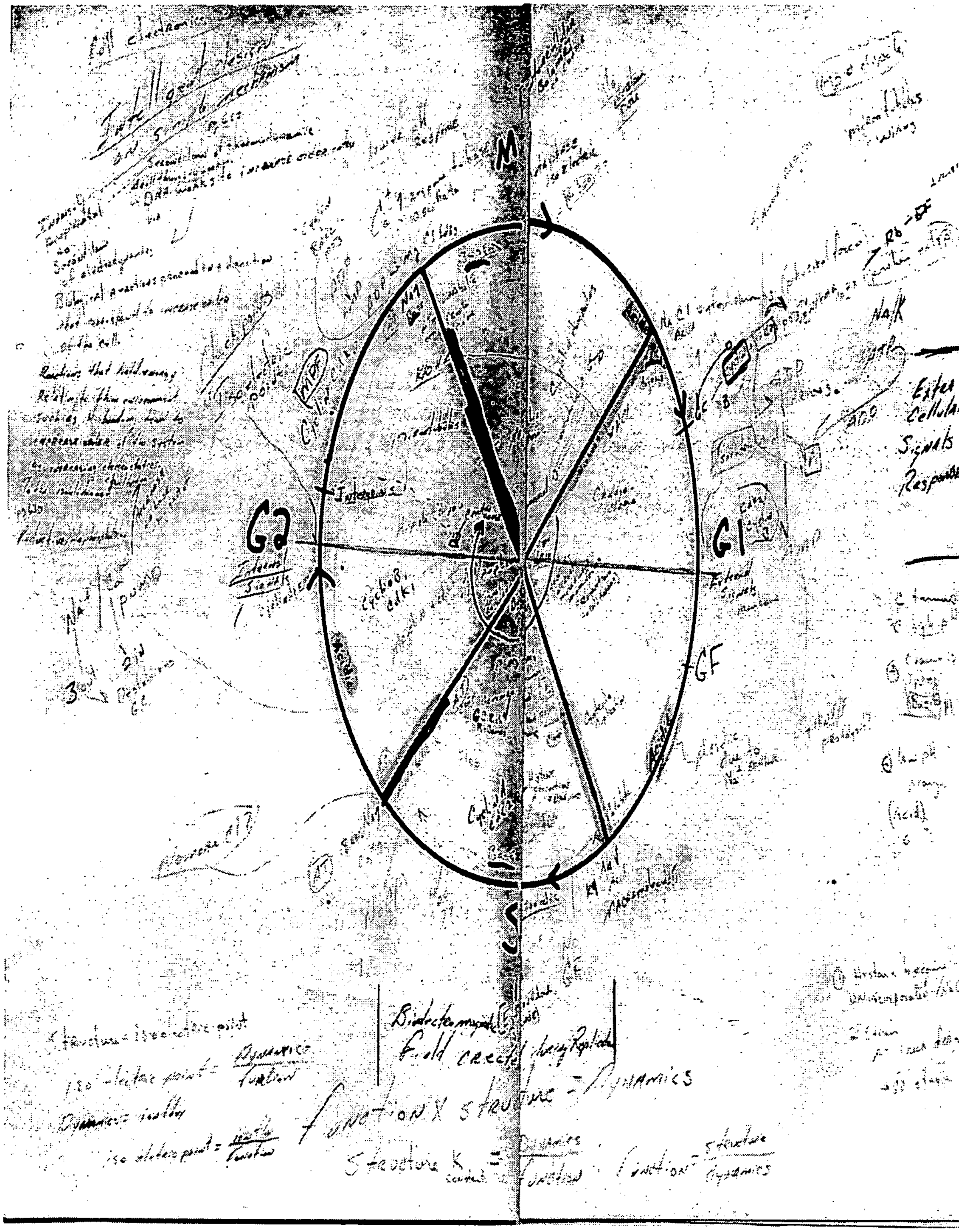
Electric fields have played perhaps the greatest role in our understanding of DNA gel electrophorisis. The knowledge to resolve DNA, genes, RNA and protein according to electrical properties has exist for decades, yet our understanding of the how and why has been overlooked. From stretching (121), pulsing from free to condense from (54), electrotransfer for gene therapy (118,103), to regulation of gene (98) DNA does have a charge transport system (6,8, 32, 33, 34,35,97, 129). Electrostatics in DNA- peptide complexes(97).

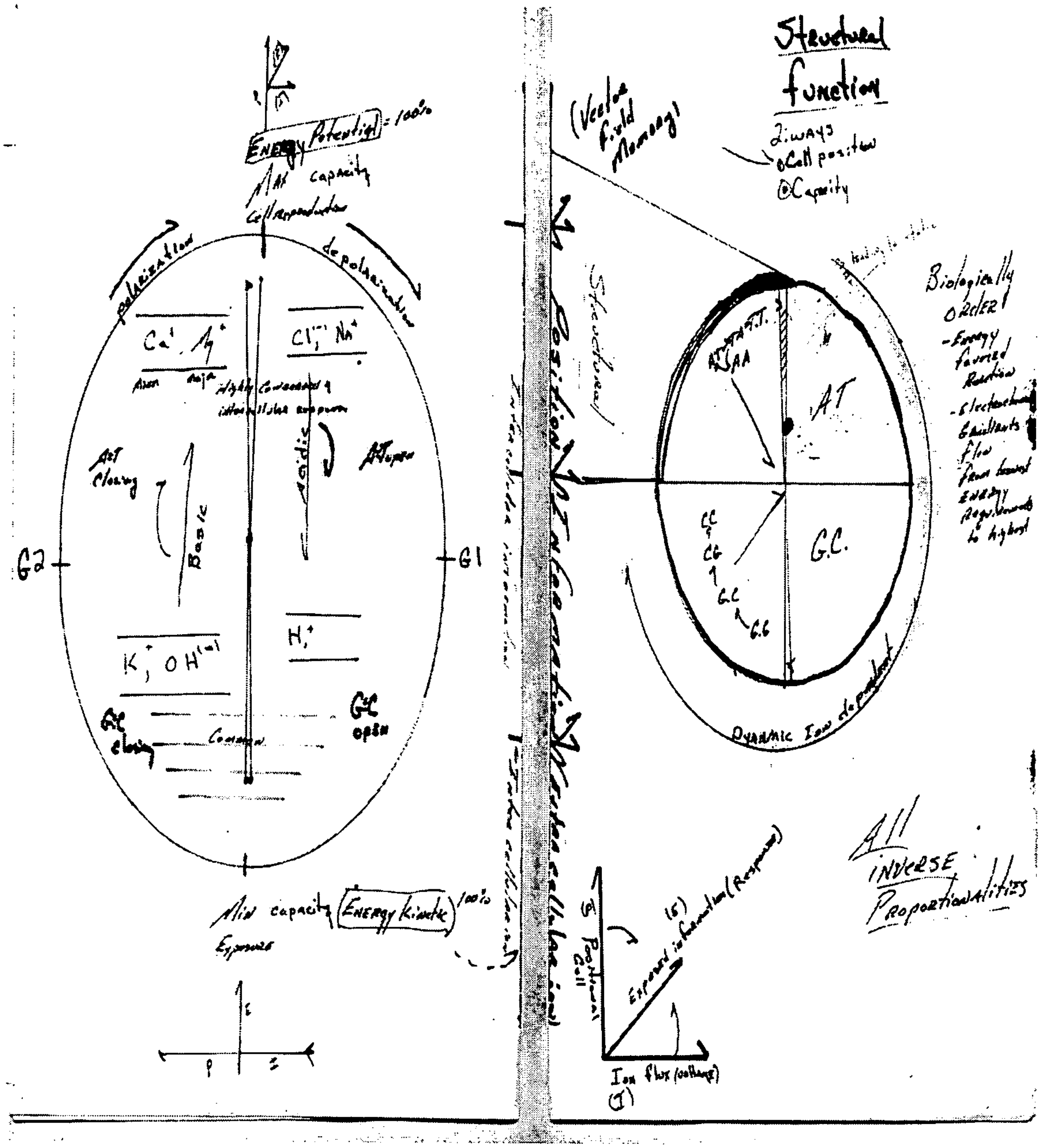
Magnetic fields do effect cells (119 120,125,126, 128), and radio frequency (122). Signals from both electromagnetic fields (EMF) and ultrasound (US) have a clinically significant effect.

DIAGRAMS



Phase Transition
Interior Response
Metaphase MAX
MIN
12
Closing
Highly Conserved
High Conserved
OPEN
G1
Closing
6 o'clock
MAX
Exterior
Response
Max
Volume greatest here
transport (Rush HOUR


M
G1
G2
S
GF
Extra Cellular Signals Response
Interphase


Structural
function
2 ways
Cell position
Capacity
Energy Potential = 100%
Max capacity
polarization
depolarization
G2
G1
Basic
Acidic
K, OH(-)
H+
Common
open
Min capacity
Energy Kinetic
100%
Exposure
A.T.
G.C.
Dynamic Ion dependent
Biologically
ORDER
All
INVERSE
Proportionalities
Ion flux (voltage)

Technology

TECHNOLOGY

Thesis: The ultimate design of DNA harmonizes electromagnetic symmetry mechanics which control the cell.

Model: The simplest unit of life exhibits the simplest mechanism of function. Modeling a cell as a battery ~~precisely~~ operates in regulating coordination of the cell environment while maintaining genomic stability. or as electrical device (magneto elastic transducer)

Function: The physiochemical properties of the spatiotemporal organization within a cell are regulated by the nuclear DNA structure. DNA structurally functions though electro~~static~~ interaction yielding unparalleled explanation of cellular response, control and reproduction.

DNA intracellularly orchestrates synthesis of biomolecules in response to electrochemical energy in cellular biochemical pathways though electrostatic interaction. The mechanism validated during metaphase when DNA is in highest ordered state (chromatin). It is not chemically or biologically active; therefore, electrostatic control confirms the mechanism of cell division.

Theory: Chromatin, at metaphase, only physiochemical property is the attachment of microtubules to kineochord. DNA only directs electromagnetic energy by its structure. Its structure focus electromagnetic energy though kinetochore to microtubule organization center. The movement of chromosomes is in no way static it is a dynamic process the formation and deformation of a magnetic field, bioelectromagnetic field.

Electrodynamics: The physiochemical properties of the spatiotemporal organization within a cell being regulated structural confirmations of the DNA. The four structural confirmations of DNA, physiochemical properties of the spatiotemporal organization, are electrodynamic and in ordered energy of ionic controls and function as magnetoelastic transducers.

To exploit the technology of bioelectromagnetic fields, bioelectromagnetic, ordered energy and electrodynamics of biological system via genetic cures and technological revolution.

The last exploration of electromagnetic fields in cell biology lead to the development of the most use cancer drug: cisplatin close to forty years ago.

Some technology exists yet without explanation the technology has no usable value. The mechanism of action of existing and new technologies must be brought forth.

Academic considerations:

Teaching tools:

Staining kits created for the use of the electrodynamical cell activity.

Research tools

These kits like the Gram stain will be hallmarks of understanding dynamics of the cell. Staining reagents will show the electrical activities of cell cycle.

Model

3D magnetic field boxes will show the relationship of magnetic energy and those used to regulate the cell.

Physics: this technology takes into consideration all know laws ~~and~~ to explain ~~and~~ validates uses of these laws for all biological systems. And expound

Nanoscale electrostatics: Nanoscale electrodynamics

Chemistry: new chemicals and use delving of chemicals to alter effects of electrodynamic, ordered energy usage within biological system.

Biology a new exploration of how biological system work and interact, which include responses to intercellular composition, extracellular signals, growth factors, chemicals, harmonics, vibrations, frequencies, light, and the cells' ability reproduce.

The cell cycle control is accomplished by ionic current ,transduction of ion specificity to many known and (unknown) signal pathways this is in a highly ordered fashion with the simplest ordering of the system. These are transduction and switching pathways lead to the complexity and counterintuitive nature of logical scientific understanding. The cell is an electronic structure. Its function relates to the structural positional information of the DNA within the nucleus and outside as during cellular reproduction. The cell also is subject to environmental constraints it s own structure and position with a biological system. The model presented shows this functioning mechanism in its lowest ordered state. The lowest ordered state is the magnetic component of an electrical energy represented by a poynting vector. A magnetic field created intracellularly mechanistically controls cellular division/ Simplest Representation to the more elaborate Representation

Terminus

These signal transduction pathways are regulated by the nature of (+)n terminus and (-)c terminus and the physical nature of biomolecules such as Amino acids intercellular and extracellular membrane bound integrin. DNA is the most dynamic electrical module within the cell. DNA unique structure and function displays the complexity of bioelectromagnetic fields.

Superconducting Quantum Interference Devices (SQUIDS) used in biomagnetic studies. Squid technology is almost actually the way in which DNA functions. The principles are the same/

ELECTRODYNAMIC control of Ordered Energy

Structural Dynamics of DNA control th cell.
Bioelectromagn tic fi ld which control intracellularly control the cell

Case Number

Lead Inventor Anthony S. Fuccione

Categories

New energy source
EMF, SMF power lines, cell phone, electrical machines, etc
Magnetic Shielding
Biosensors: based on genetic function
Cellular Biology
Embryology
Physiological
Diagnostics
Molecular Biology
Cancer research
Gene expression
MRI based on bioelectromagnetic fields
Physics Motor and Computer Nanotechnology
Molecular Motors
DNA computer: though the dynamics of DNA intercellular compositions
Supercomputers
Software systems
Superconducting Quantum Interference Devices (SQUIDS)
Energy medicine
Explanation of whole genomes

Which include responses to intercellular composition, extracellular signals growth factors, chemicals, harmonics, vibrations, frequencies, light, and its ability reproduce.

Summary

Cellular response to intercellular DNA electrostatics to anisotropy affects and effects in understudied phenomenon with extremely broad implications. An invention from Anthony S. Fuccione describes systems and methods for measuring the electrostatic (which are dynamic) **electrodynamics** properties of a cell. The electrodynamic properties of DNA within the cell govern its activity, its ability to precisely illicit responses to intercellular composition, extracellular signals growth factors, chemicals, harmonics, vibrations, frequencies, light, and its ability reproduce. The characterization of these properties will not only increase the general understanding of cellular reproduction, cell

electronic

cycle controls and phase patterning in embryology it will offer new possibilities for diagnosis of cell pathologies, and evaluation of the efficacy of various types of therapy, exploring electrical devices or any device which produces or emanates frequencies that interfere with the bioelectromagnetic field of cellular DNA.

electrical imaging devices

Summary

In this technology, bioelectromagnetic fields of intercellular DNA are mapped electrostatically and mapping of the electrodynamic, transitions and responses inter and ~~extra-cellular~~ which can be measured unidirectional, by poynting vectors, light scattering, liquid crystal formations, harmonics, oscillatory. The manner in which the DNA takes on dynamical transitions in reaction to the applied chemical, harmonics, drugs, physical(heat, light, sound, magnetic force or physical force) are then used to characterize the cellular response electrodynamics of the cellular DNA. The amount and rate of change in DNA are quantified and used to determine cellular changes in response to stress, strain, viscosity, elasticity and impedance applied by chemical, drugs, harmonics, physical(heat, light, sound, magnetic ~~force or physical~~ force). Mechanistic treatments that neglect to take into account the importance of the MEP of DNA may be flawed or deficient in many cases. An increased understanding of the basic mechanisms of redox chemistry within DNA may aid in improved anticancer drug design. (30) "observations require consideration in designing new chemotherapeutics and in understanding cellular mechanisms for DNA damage and repair." (35)

Knowing the mechanistic controls will improve all drug designs.

1) Develop of drugs of all diseases based on electrodynamics of the bioelectromagnetic field theory.

physcology

Diseases include all medical application including physiological, ~~physiological,~~ fertilization, bacterial, virus, Bone repair, Nerve stimulation, Wound healing,Treatment of osteoarthritis, Electroacupuncture,Tissue and organ regeneration, Immune system stimulation, Neuroendocrine modulations.

The technology will rapidly lead to genetic cures for Cancer, cystic fibrous, Parkinson, muscular dystrophy and alike.

Applications

Cure for all disease though Genetic function within a single cell, cells, systems, tissues, organs and organisms understanding the bioelectromagnetic dimension.

The invention teaches how to measure the electrodynamic structural transitions of DNA changes anisotropic and cell permitivity and the response to any time of stimuli as described. Changes in gene expression, cell field value, can be measured in response to a normal" or average value.

Moreover the realization of this technological break though will teach an academic clear illustration of cellular reproduction, yet the "cell cycle control".

The understanding will change the way in which biological research is approached and studied. The understanding will change medicine as we know it and the way in which traditional medical philosophy has approach disease and treatment.

The application of looking at the cellular level leads to cell- cell communications, cell tissue, tissue to organ, organ to organism.

SUPER COMPUTER

QUANTUM PHYSICS PRESENTS INTRIGUING POSSIBILITIES FOR ACHIEVING COMPUTATIONAL GAINS AFTER CONVENTIONAL MINIATURIZATION REACHES ITS LIMITS.

Cellular DNA functions are a limit that has been unexplored. Its possibilities includes all living organism and those with interact with living organism

DESCRIBE A NUCLEAR MAGNETIC-RESONANCE
QUANTUM COMPUTER DEMONSTRATING A QUANTUM ALGORITHM THAT EXPONENTIALLY OUTPERFORMS CLASSICAL ALGORITHMS.

DNA has this ability though Hamilton Path projections

Think of a computer how valuable they are to our society. Think of the ultimate computer. It has been defined beyond our wildest dreams. Turning machine: an abstract representation of a computer it has a read/write head a binary system 0 or 1. It function has three areas. It knows were it is. 2 it knows the number on which it is starting. # it has instruction on were to go.it can compute anything and in fact it is more like software then hardware

Hamiltonian Paths

Simplicity is the art of genus. The traveling salesman Mr Loemen must pass though 23 city and only hit each city once due to time constraint. Sounds Simple yet in actuality complex mathematical computation for which there is no algorithm. Yet using DNA template solution of the problem, the most quickly and efficient way possible is found. Now let us view DNA as a turning computer that uses Hamiltonian paths. What are the constraints on DNA? There can only be two: energy and it own limitations.

Applications Consideration

Note: Blood is considered an electromagnetic sink.

http://groups.yahoo.com/group/bioelectromagnetics/
The group mostly studies effects of emf from power lines cell phone and machines.

This is a forum for scientists and non-scientists alike to share their views on the science of bioelectromagnetics, which is the scientific study of the interaction of electromagnetic energy (at frequencies ranging from zero hertz through those of visible light) and acoustic energy with biological systems. This group is moderated by members of the Bioelectromagnetics Society (BEMS), the world's largest scientific society for promoting research and communication on bioelectromagnetics, but it is not an official activity of the society, nor do the views expressed in this group reflect the positions of BEMS.

(141)http://www.mmfai.org/files/research/Washington%20Seminar%20on%20RF%20Mechanisms.pdf. A group of scientists with backgrounds almost exclusively in the areas of biophysics and physics met in Washington, D.C. on May 22-23, 2001 to evaluate mechanisms for interactions of radiofrequency (RF) energy with biological system

Understanding how electrical charge moves through DNA could help researchers understand and perhaps develop a technique for reversing the damage done by oxidation. Natural biological processes repair much of the damage, but some damaged sections aren't repaired fast enough to avoid further damage -- and genetic mutations.

"It may be possible to intervene and accelerate the repair mechanism or inhibit the damage through pharmaceuticals or procedures," Schuster said. "That would be important for certain people who have diseases in which the mechanisms for repairing DNA are inefficient."

Other applications could include new diagnostic techniques for spotting the DNA of disease-causing organisms, or even mutated copies of DNA. Also possible would be mesoscale micromachines that take advantage of DNA's self-assembly capabilities and the enzymes available to control that assembly.

"The charge transport mechanism of DNA is being explored as a mechanism for the development of new gene diagnostics," he explained. "If DNA can act as a conductor, you would be able to develop diagnostic probes that would allow you to detect DNA from a bacteria, or a certain mutation."

~~Looking far down the road~~, DNA offers advantages over the micromachining processes now being used.

"DNA has the amazing ability to construct itself," Schuster noted. "Rather than having to build a machine atom by atom, you can take advantage of the ability of DNA to organize itself into complex structures. DNA comes in prefabricated parts that fit together, and that offers a tremendous advantage."

CHARGING THROUGH DNA: RESEARCHERS SUGGEST NEW MECHANISM TO EXPLAIN DNA
>CHARGE TRANSFER PROCESS

>

YAHOO! Groups Groups Home - Yahoo! - Account Info - Help

Welcome, anth_onyz (Anth_onyz · anth_onyz@yahoo.com) Start a Group - **My Groups** - Sign Out

drjhm · Electronic homeopathy for the New Millennium. **Pending Member** [Edit My Membership]

Welcome eGroups Members! Learn More

▸Home
Messages
Chat
Bookmarks
Database
Polls
Calendar
Promote

★ = Owner
☆ = Moderator
☺ = Online

Description **Category:** Homeopathy

Electronic homeopathy for the New Millennium.

In the 19th century Dr. Samuel Hahnemann, homeopath, empirically showed that a medical cure is achieved through certain laws of healing that exist in nature and that nobody can cure outside these laws.

20th century technology known as harmonic translation (HT) refers to the process of translating information from a biological source into stored digital data. HT technology utilizes high speed computer accuracy with precision frequency control translating bio-information into electromagnetic signals carrying the homeopathic information.

DNA

In the 21st century as we begin to think about human beings as bio-electromagnetic beings, we can begin to comprehend the powerful effects of electromagnetic healing modalities which deliver specified quanta of subtle energy in the form of a sine wave (wave signatures) to promote healing.

It is time to give up tampering with the biochemistry of disease - which is the result not the cause - and to begin investigating medicine from a completely different and more essential viewpoint. HT technology addresses the bio-electromagnetic energy fields which govern human life and health.

The physics of electromagnetic energy, predicted by Einstein's equations, holds the keys to deciphering the scientific principles which underline the behavior of HT technology.

Group I
Membe
Founde
Langua
Group
· Listed
· Restri memb
· Unmo
· All me
· Archiv only
· Email not pe

The Meridian System And The Mechanism Of Acupuncture

Charles Shang
Boston University School of Medicine
Box 275
80 E. Concord Street
Boston, MA 02118

ABSTRACT:

Understanding acupuncture points and the meridian system in terms of modern science is important to facilitate the study and application of related techniques. The model which relates organizing centers in morphogenesis and growth control to acupuncture points can qualitatively explain most of the established facts about the meridian system and acupuncture points, such as their distribution, high electrical conductance, response to non-specific stimuli and polarity of electrical stimulation. As a network of singularities in signal transduction, the meridian system plays an important role in physiological and growth regulation. The change of electrical activity is part of signal transduction and can precede anatomical change during morphogenesis as well as pathogenesis. Small perturbations around singular points can have decisive effects on a system. Therefore, manipulation of acupuncture points, the singular points in the signal transduction system, can be an efficient way of diagnosis and therapy, particularly at the early signal transduction stage prior to the stage of morphologic change. The model can also

MIT News

MIT researchers control biological materials with radio waves

JANUARY 9, 2002
Contact Information

Media Lab postdoc Kimberly Hamad-Schifferli, one of the authors of a paper on biomolecules and radio waves, at work in the lab at the Center for Biomedical Engineering. *Photo by Laura Wulf*

CAMBRIDGE, Mass. -- It's not exactly "ET, phone home," but researchers at the Massachusetts Institute of Technology report in the January 10 issue of Nature that they can "speak" to DNA biomolecules with radio waves.

The goal is to instruct biological materials how to act for a variety of purposes. Biological machines may one day be used to perform computation, assemble computer components or become part of computer hardware or circuitry. Radio-controlled biology may lead to single-atom or single-molecule machines or the ability to hook tiny antennae into living systems to turn genes on and off.

"Recent studies have provided new insights into the complexity, precision and efficiency of biomolecular machines at the molecular scale, inspiring the development of physical and chemical manipulation of biological systems," said Joseph M. Jacobson, associate professor at the MIT Media Lab and an author of the study. "Manipulation of DNA is interesting because it has been shown recently that is has potential as an actuator (a hard drive component) and can be used to perform computational operations."

MIT researchers predict that radio frequency (RF) biology will have a broad range of applications. Because virtually all biological molecules can be linked with gold or other

SEEKING ULTIMATE ANSWERS

"The development of molecular biology has witnessed many examples of ways to design new tools that accelerated uncovering nature's secrets," Zhang said. "Regulation of biomolecules using electronic RF control represents a new dimension in biology."

The exquisitely fine electronic controls of biological regulation will likely become more and more important in understanding complex molecular interactions in great detail, he said, because there is currently no other way to achieve fine local control without disturbing neighboring molecules. He likened the level of communication to using a mobile phone to convey a message to a single person in a crowd.

"Radio frequency biology provides us with some extraordinary tools and with unprecedented precision controls to study biomolecules and their interactions. These new tools and technologies will undoubtedly accelerate and advance our knowledge in finest detail. It not only opens new avenues for us to ask big and deep questions but also to attain the ultimate answers in biology," Zhang said.

In addition to Jacobson, Hamad and Zhang, the study's authors are John J. Schwartz, a former postdoctoral associate in MIT's Center for Biomedical Engineering who now works for a company called engeneOS in Waltham, Mass., and MIT student Aaron Santos. Jacobson and Zhang also are affiliated with engeneOS, which designs and builds programmable biomolecular devices consisting of natural and non-natural materials for commercial applications.

This work is funded by the Defense Advanced Research Projects Agency (DARPA) and the Things That Think consortium at the MIT Media Lab.

--END--

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THE HARVARD NANOPORE GROUP

The Molecular Structure of Biopolymers:

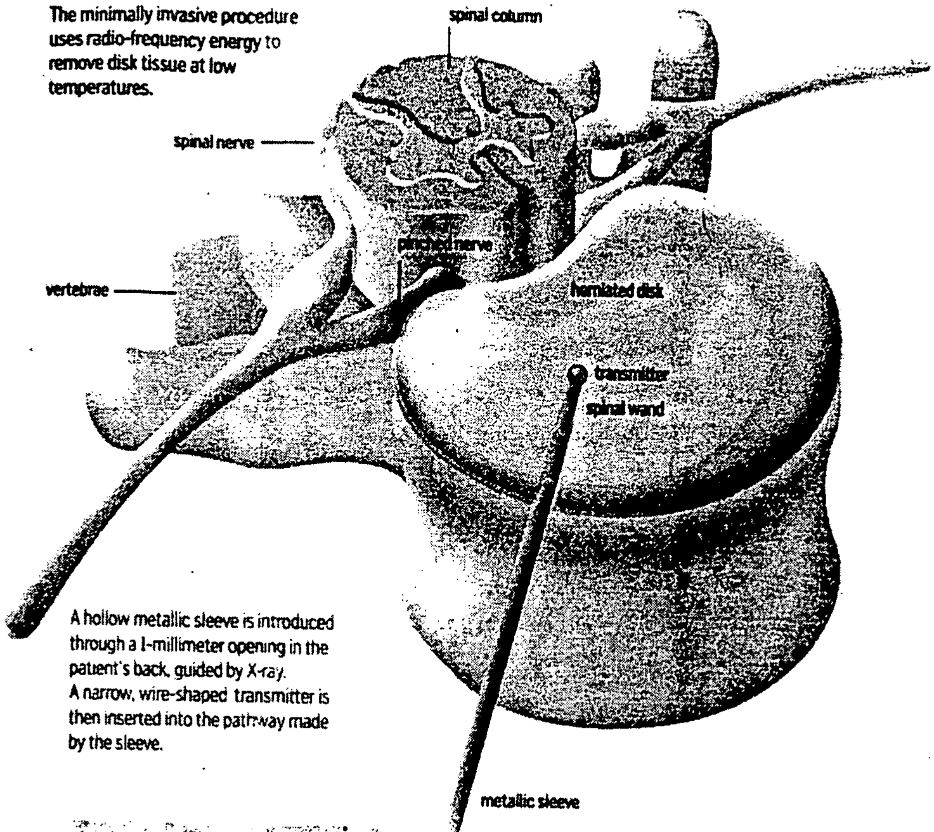
Developing Nanopores as Probes

A hallmark of modern science has been the continual developmen experimental strategies to observe individual atomic scale 'events'. These strat ultimately rely on significantly amplifying the consequences of a sele microscopic interaction, for example the chemical development of a silver h grain in a photographic emulsion, or the charge amplification in electron multi devices. Research performed by members of the nanopore research grou Harvard has shown that individual polymers associated with replication regulation of life, DNA and RNA, can be registered and characterized singly w new kind of detector, a nanopore.

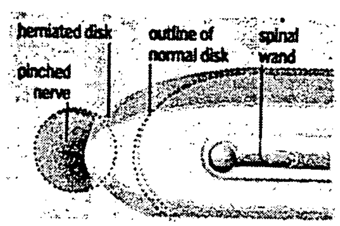
A nanopore can be a protein channel in a lipid bilayer or an extremely s isolated 'hole' in a thin, solid-state membrane. For a nanopore to be useful single molecule detector, its diameter must not be much larger than the size o molecule to be detected -- just a few tens of Angstroms across. When a s molecule enters a nanopore in an insulating membrane, it causes changes i nanopore's electrical properties that are readily detected with modern elect devices and circuits. The mission of the Nanopore Group at Harvard is to stud science of single molecules in nanopores. Our aim is to use this knowledge to de an ultra high-speed method for sequencing DNA, but we are also developi number of other important, but less demanding, applications that utilize extraordinary sensitivity and speed of nanopore probing. On the path to achi sequencing, we are modeling the physics of DNA polymer movement throug confined space of a nanopore, coordinating the application of material science to fabricate solid-state nanopores, and developing the associated biochemi molecular biology, electronics, and signal processing to effect molecular recognit

How nucleoplasty works

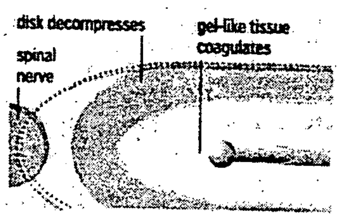
The minimally invasive procedure uses radio-frequency energy to remove disk tissue at low temperatures.



A hollow metallic sleeve is introduced through a 1-millimeter opening in the patient's back, guided by X-ray.
A narrow, wire-shaped transmitter is then inserted into the pathway made by the sleeve.



Radio-frequency energy from the spinal wand triggers a process that breaks down the gel-like tissue.



As the spinal wand is withdrawn, the disk decompresses to a size and shape that no longer presses against the nerve.

SOURCE: Dr. Joshua A. Hirsch, Harvard Medical School and Beth Israel Deaconess Medical Center

GLOBE STAFF GRAPHIC/HWEI WEN FOO

The spinal wand that transmits radio waves.

By Stephen Smith
GLOBE STAFF

The human back is a marvel of engineering, an architectural masterpiece rising around a spinal I-beam that braces floors of interlocking muscle and tissue. It is the body's most complex joint, capable of twisting and turning – and breaking.

When the structural integrity of the back crumbles, pain knifes downward, through the legs, into the feet. Lives turn miserable. Work becomes unbearable. In 2000, Americans made 23 million visits to doctors because of low back pain, and up to 80 percent of adults will experience significant back problems during their lifetime.

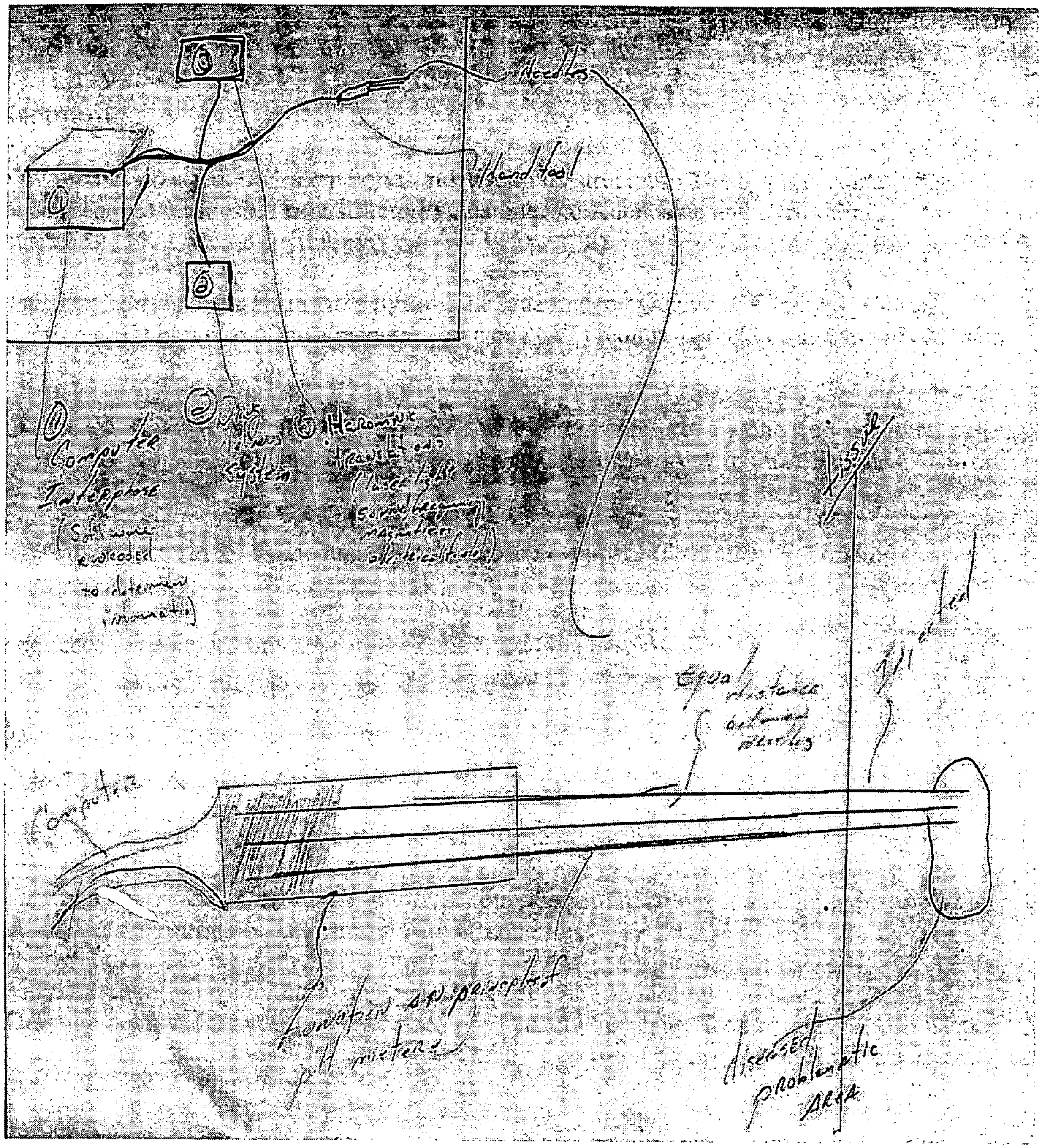
In an aging nation with rising expectations, back pain may be ubiquitous, but it is no longer regarded as acceptable, which explains the development of an ever-expanding constellation of methods for fixing broken backs. There's everything from the ancient art of acupuncture to the brand-new use of radio waves to vaporize chunks of errant disks.

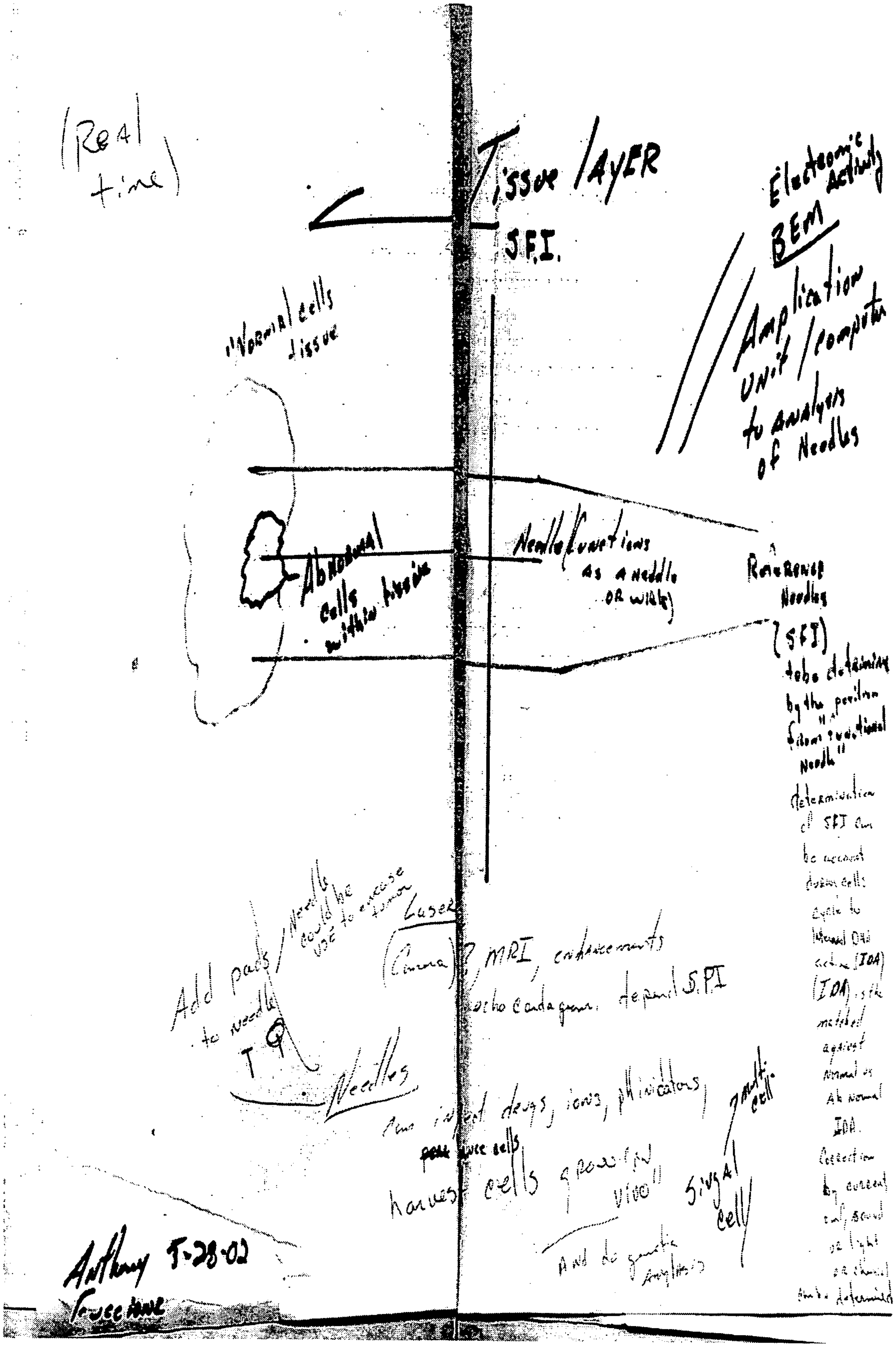
Increasingly, such disparate disciplines exist under the same roof, even at hospitals once hailed as bastions of traditional medicine. Consider as one example Beth Israel Deaconess Medical Center, a place where the healing touch of the East meets the emerging technology of the West.

Dr. Cheri LeBlanc found herself there last week, belly first on an operating table. She comes from a long line of bad backs. She had gone through medicines, physical therapy, steroid shots.

After years of suffering, LeBlanc, 39, solicited the advice of a Beth Israel Deaconess neurosurgeon, who sent her to a colleague who is among the pioneers using a new technique to still the gales of back pain. It's called nucleoplasty, and it involves burrowing into a

BACK TREATMENTS, Page C3


Needles
Hand tool
① Computer
Interphase
(Software
encoded
to determine
information)
③ Harmonic
System
tissue
Equal
distance
Computer
diseased
problematic
Area



(Real time)
Tissue LAYER
S.F.I.
Electronic Activity
BEM
Amplication Unit / computer to analyze of Needles
Normal cells tissue
Abnormal cells within tissue
Needle functions as a needle or wire
Reference Needles (SFI)
Laser
MRI, enhancements
harvest cells
vivo
Singal cell
multi cell
Needles
Add pads to needle
Anthony 5-28-02

Terminology

All life, in its most basic form, is cellular. A single cell possesses enthalpy (chemical bond energy) relative to its environment. Nernsts'equation takes enthalpy and free energy changes entropy into consideration, single ion concentrations. "Ions always move down their electrochemical gradient." Ions diffuse down there concentration gradient. It is easily related to say that electrochemical gradients always move down there electrochemical potential: thus always highest energy requirement is compensated first to lowest degree. Systematically (ordered energy) the greatest energy requirement or work are compensated first and systematically the energy needed lessens to accomplish work done last.

Ordered Energy (OE)

Macroscopic effects due to microscopic ordering in quantum fields.
Bose condensation theory.

In their simplest form the understanding of ordered energy requirements from conventional perspective a biological systems (a cell) and chemistry analysis of the mechanisms of interaction confirmation from analysis physics of complex interactions are energically favored reaction.

Biological system are highly ordered in the way which they reaction which is largely due to electronic strength of bond and ion concentration.. The sodium/potassium pump within a cells' membrane is a favorable ordered energy.

We will examine interact acts of ions, bonding forces, p.H., biomolecules, nuclear and genomic DNA.

Ions

The periodic table of all known elements is expressed by their electronic arrangement. As for electronegativity of H 2.1> Mg1.2> Ca1.0 >Na 0.9 >K0.8 and react relative to this arrangement. Nernsts'equation takes enthalpy and free energy changes entropy into consideration, single ion concentrations. "Ions always move down their electrochemical gradient."

Bonding

Forces holding molecules together posses and are classified by relative strength of interparticle forced or bond energy. This are listed from the highest strength to the lowest due to there relative strengths (electronic) thus, react in this order. The later three most important to reversible interactions of biomolecules due to there non-covalent nature.

Covalent bonds> Metallic bonds>Ionic bonds>

Hydrogen bonds> Electrostatic bonds> van der Waal forces.

Relating these reactions from a higher to lower orders concentration relates directly to electrochemical gradients. Electrochemical gradients always move from higher concentrations to lower.

Reactions in a biological system always move down their concentration gradient, so constituent bonding and electronic arrangement are the controls of the ordered energy.

Biological systems are highly ordered in the way which they react, as a cell mediates a highly ordered energy chain.

Hydrogen bonds > Bonds are highly directional and stabilize amide (-NH) and carbonyl (-CO) groups. DNA double helix is held together between bases on opposite strains (Biochemistry, Stryer 3rd edition).

Electrostatic bonds > *Histone and Dna Linkages*

van der Waal forces. Non- specific attractive force, which has a very strong repulsive force due to electron cloud density and is dependent on steric complementarity, such as Metaphase chromosomes.

p.H

Overall simply relate ordered energy to p.H. Ionic strengths (acid/base) (oxidation/reductions) reactions show the driving forces of electrochemical reactions.
The moving of a single H+ ion (electron) is an electrical component. (Electron transfer systems i.e. photosynthesis)

p. H

Defined as the negative logarithm (log) of H+ pH= -log{H+ }Hydrogen ion concentration. We usually use a titration of as a capacity to neutralize a base and as Oh- is added H+ reacts to from water to reach a equilibrium according to Le Chateliers principle.

Acid base reactions

- In general a neutralization reaction between a chemical cell (cytosol)
- Full equation HCl+ NaOH> NaCl +H2O
- Total Ionic equation H+ + Cl- + Na+ OH-> Na+ + Cl- + H2O
- Net ionic Equation H+ = OH-> H2O

Biomolecules

In term of electrochemical potentials DNA >>>>RNA>>>Protein>>Amino Acids> i.e. information flows down the electrochemical gradient during cell metabolism.

DNA at the cost of assembling DNA is flow down its electrochemical gradient yet this must be ordered energy.

There are two major interactions in the cell cycle: synthesis, decondensation of DNA and condensation during metaphase. The energy used in replication creates the order of a dipole interaction in base pairing in equal yet opposite manner creating the order of magnetic force and in mitosis a magnetic field. DNA functionally held during metaphase in a magnetic field which was created by electromotive force during DNA synthesis.

Genomic

DNA stores charged, hydrogen bonds, relative to its structure. The bases (nucleotide) are separated into purines,(2 ring structure) Guanine and Adenosine and pyrimidine, (1 ring structure) Cytosine and thymidine.

The base pairing are a purine to a pyrimidine, guanine to cytosine (GC) requires three hydrogen (H) bonds and the adenosine- cytosine (AT) require two H bonds which hold them together.

One can see two requirements base pairing, a two ring structure to a one ring structure, pairing content (GC) (AT) and that GC pairing requiring more energy with three H bonds. The order energy shows GC to AT.

The ordered energy of single nucleotide bases are G >A>C>T and they H-bonding in such a way.

Sequence dependent steps are (ordered energy) of the base pairs.

Electrodynamics

Think electrically and subtract heat.

Photosynthesis electromagnetic energy is converted into chemical bond energy. pg.61.

Thermodynamic reactions for the mere fact the (thermo) heat loss is an energy loss, therefore the higher ordering may be electrodynamic properties.

Although traditional chemistry and consequencely biology, follow the Laws of Thermodynamics Physics uses expressed physical laws such as electrostatics. Electrostatics are motionless and biology, the study of life, being constant motion. Therefore, due to the (electro) chemical nature of life held within the physical laws an Electrodynamical view appears more exact.

Fundamental entity of nature consisting of negative and positive particles demonstrates attractions and repulsions: Electricity. These attractions and repulsions manifest themselves as movements of charged particles, electrical current.

Synergistic networks, such as the dynamic instability of microtubules play pivotal roles in understand of biological systems. The rationale to view a biological cell as an electronic structure through examination the electrodynamics exceeds thermodynamic understanding.

"the sperm, polar body, and egg centrosomes were superior, intermediate, and inferior, respectively, in their ability for aster formation"(38). This is the order energy electrodynamically of mitotic asters (MTOC).

Perhaps the simplest traditional biological system is called photosynthesis. Photosynthesis displays the lowest order of energy, that of a single photon of light driving a single electron though an electron chain (energetically favorable) reaction. The simple movement (excitation) of a single electron via single photon (single package of energy) drives the electron chain (electrochemical gradient) system yielding energy in the form ATP. This shows a lower ordered energy state that is not thermodynamic yet electrodynamic.

Electrochemical proton gradient, (16 pg 653), drives hydrogen ions H+ across a membrane, chloroplast, analogous membranes include mitochondria, plasma membrane.

These are higher ordered energy (oe) mediating their ordered electrochemical gradients, thus they are electrically favorable ordered in nature. The common currency of a cell is a high energy molecule called ATP adenosine tri-phosphate, (tri) three phosphate bonds. The method of payment is the making or breaking of a single phosphate bond, therefore, a single free potassium (ion).

"The cell cycle is a cyclic process of successive transient activation or inactivation of cyclin-dependent kinases by association with different cyclin regulatory subunits or cyclin-dependent kinase inhibitors". In general activations are by the input of single K ion. Further the OE is answered by the "specificity of the enzyme". "The binding of different cyclins, required to activate the catalytically inactive cyclin-dependent kinases, determines the substrate specificity of the enzymes."(48), thus an example of an OE explained electrodynamically.

Signaling pathways which induce change within the cell appear complex biochemical reaction, as they are. Chemical reactions looked from OE as p.H. (acid base reactions), (hydration reductions) the flow of electrons even a single electron (hydrogen electron) within biological cells controls the metabolic pathways.

Catabolism breaks down of biomolecules

Anabolism synthesizes of all biomolecules.

Metabolic pathway sequesters of reaction the electron transport chain an increase affinity for electrons.

Amino Acids

Amino acids are known to have charge in dynamic ways, p.H. dependent and have specific solubility.

Basic structural units consist of an amino terminal group (COO-), a carboxyl terminal group (NH3+) and an R- group. The ionic forms allow for a transfer of a hydrogen ion in an internal acid base reaction the products of this reaction is noted as dipolar ion call ZWITTERION to form iso electric point or a net charge of 0. Zwitterions or dipolar ionic nature of amino acids relative to p.H. ionization states appear more electrical in nature, a switching mechanism from a + terminus to – terminus.

R groups, example glycine p.H 6.06 and basic R groups, example Lysine p.H. 9.47 Aapartic acid p.H. 2.98 which proteins are composed and DNA and RNA have characteristic isoelectric points that change valence hydrogen bonding. Enzymes increase reaction rates the induced fit that structural dynamics and binding affinities are more at play then standard lock and key methods

Ion exchange specific

- Cationic H+ Acid: sulfonic R-SO3H and carboxylic R-CO2H
- Anionic OH specific: Ammonium (R-NH4) and Amine(COOH)
- Hydrophoblic, polar and no polar A>A>
- Water: Asymmetrical charge distribution making it is electrically polar stabilizing amide(-NH) and carbonyl (-CO) group, therefore, electrostatic interaction between ions are weakened.

Structural Positional Functional Information.

DNA stores charge (hydrogen bonds) relative to its structure. The bases (nucleotide) are separated into purines,(a 2 ring structure) Guanine and Adenosine and pyrimidine, (1 ring structure) Cytosine and thymidine. The base pairing are a purine to a pyrimidine, guanine to cytosine(GC) requires three hydrogen(H) bonds and the adenosine- cytosine (AT) require two H bonds which hold them together. One can see two requirements base pairing, a two ring structure to a one ring structure, pairing content (GC) (AT) and that GC pairing requiring more energy with three H bonds. The Ordered energy of the genomic information is GC to AT banding, and is replicated in such a fashion. AT have a lower energy of activation with 2 H bonds therefore proceeds first. **Electrodynamically favorable.**

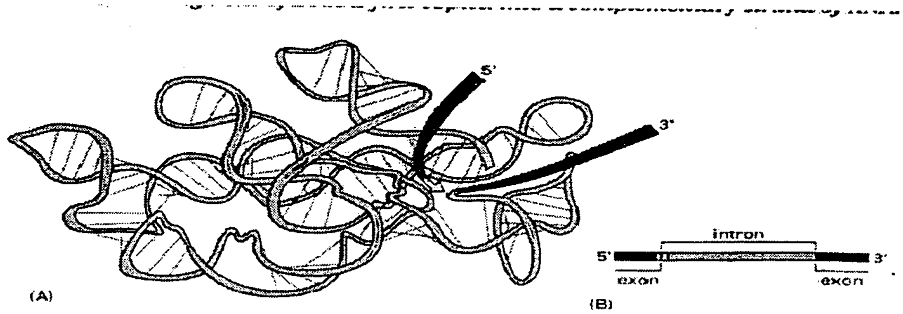
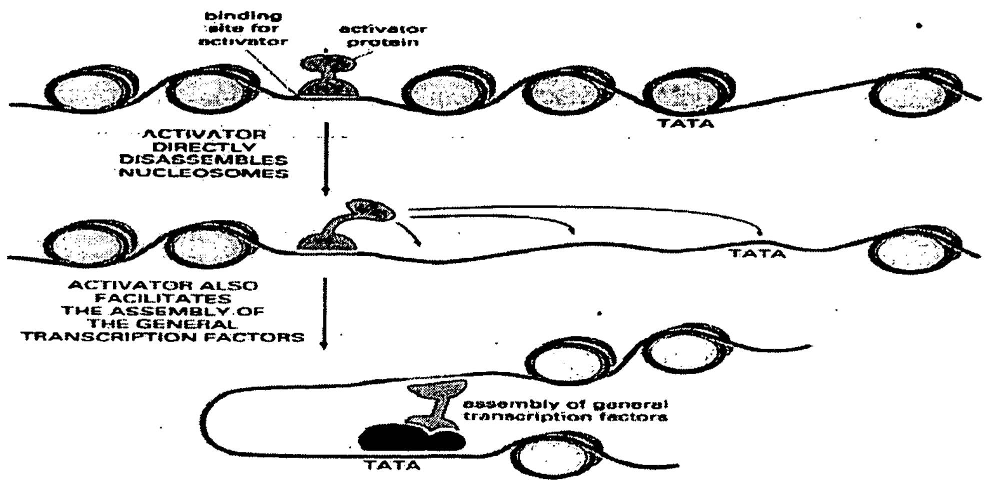


Figure 3–24 A three view of the catalytic of intron RNA seque Figures 3–21 and 3– molecule, with hydr interactions shown i molecule, which is a nucleotides long, is s immediately after th 5' side of the intron (Schematic of the mo unfolded form. (Ada Jaeger, E. Westhof, a *Mol. Biol.* 221:1153–

110 Chapter 3 : Macromolecules: Structure, Shape, and Information

As fig 3-24 illustrates the blue extrons and the green introns, we know the postional structural information in the extron. When the information is transcribed the confirmation changes will take place relating to new structural postional information such as below.



Consider fig 3-24 as the same DNA as in the above. The bead on a string structure DNA Histone incorporation, the binding site affinity for this specific region is EO. That the TATA box is activated this show OE as TATA requires the least energy(than GC) for activation. The new assembly now shows NEW **Structural Positional Functional Information which is OE.**

The structure hierarchies of DNA change the topographic information and access to information on the DNA to a maximum at metaphase chromosome.

This folding patterns (functional packing) are similar to electrophoretic properties which determine specific rate of interaction (biological recognition). Molecular transitions induce change via ionic environment of OE. The "relevance of the topology-related DNA conformation in protein interactions and define the particular role of the helically phased rotational information" as higher order structure of chromatin. (58)

"Positional and orientation order in columnar B-DNA assemblies… basis of the electrostatic pair potential that takes into account DNA helical symmetry and the amount and distribution of adsorbed counterions" ordered phases and bundling transitions strongly depending on the counterion adsorption patterns. (48).

DNA ELECTRODYNMAICS

> " organic molecules in a liquid crystal solution and used magnetic fields to communicate with the liquid crystal, which corralled the molecules into films with unprecedented uniformity"(59).

DNA has of 4 states confirmed by liquid crystal confirmation. "it is well-known that the linear packing ratio increases dramatically in each level of DNA folding in chromosomes" (58)

"Magnetic Field Alignment of the Cholesteric and High Density Mesophases in Liquid Crystalline DNA - In the presence of a magnetic field, the liquid crystalline nematic director vector will tend to align relative to the field. Because DNA has a negative anisotropy in

diamagnetic susceptibility, the molecular helices align perpendicular to an applied magnetic field, which orients the twist axis of the cholesteric phase in a manner parallel to the field." (2)

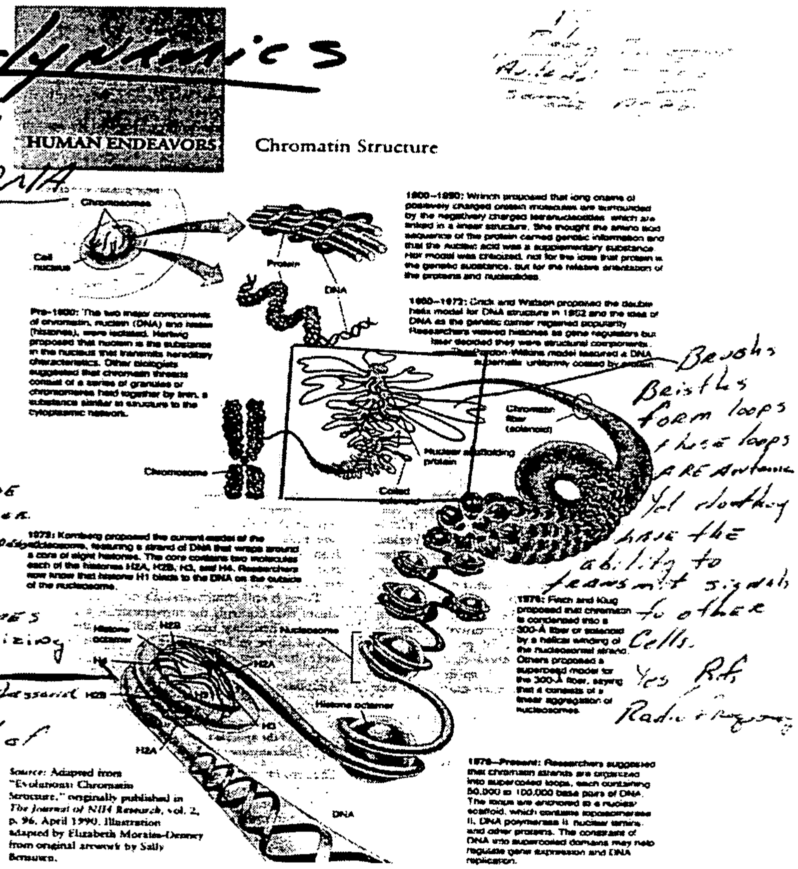
1) Double helix (Alpha coil)2 nm. a coil, a solenoid structure
   Capacitance inter molecularly low
2) Bead on string.(beta coil)11nm. A coiled coil A solenoid (with transformer like properties) Capacitance Hydration /reduction(G1>S) external signal
3) Lampbrush: (tererary coil)30nm coiled coiled looped (antenna regions) internal signal, Cyclins nucleosome
4) Chromatin: 700-1400 a super coil. Maximum coiling, minimum entropy Hertodimers / quandary dimmers, Condesin/ cohesion Capacitance full to charge

Electrodynamics

Confirmational State of DNA

(1) double helix
(2) Bead on String
(3) Lampbrush
(4) Chromosome

(1) Packing increases
"Pi-ways" decrease
(2) Free energy decrease
Capacitor or capacitance of DNA being increasingly charged.
(3) As structure becomes more compact (minimizing energy requirement)
Capacitance increases systematically



Brushes Bristles form loops these loops are Antennae. Yet nothing have the ability to transmit signals to other Cells. Yes RF Radio frequency

Histone associated
Are all of DNA's charges neutralized "balanced" at this point.
Yes, however we know that histones are overcharged (i.e.) tails

L. C. liquid crystals conformations. L.C are just that crystals much like in an old-fashion radio. They oscillate at frequency.

5)

Free energy decrease 1-4. the mediate Ordered energy of the molecule, yet genomic stability increases. This is due to the OE of the cytoplasmic ionic environment

t 'locus' is: 'The set or configuration of all points satisfying specified geometric conditions, the position that a gene occupies on a chromosome force induced by the structure of DNA at a resonate frequency.

How is energy mediated though DNA? there are structural changes, these changes create new replication sites on DNA, positional information from simple to more completed or conserved for the accurate replication and division the potential of formation/deformation of a magnetic field. Electrodynamically DNA mediates structural changes in cell permeability controlling cellular reproduction. and cell cycle

The intrinsic structure of the DNA molecule, in functions via changes ~~and~~ structure, directs electrochemical energies to electromagnetic fields (bioelectromagnetic fields). DNA intracellularly orchestrates biochemical synthesis using electrochemical energy creating bioelectromagnetic field directing intercellular constituents to replication of itself.

Fundamentally ~~DNA is the most dynamic~~ cellular component having transitional states wherein each state creates precise structural changes intracellularly producing precise functional response. Excellent

Universal laws of thermodynamics express Heat maybe in change with light the third law of thermodynamics says that entropy (thermodynamic disorder) is zero for an ideal crystal.(As with metaphase chromatin)

The system is in it lowest possible energy state has its most ordered arrangements, in terms of a single electron such as hydrogen its electron would be in equilibrium with the DNA.

DNA lowest possible energy state is metaphase and it has it most ordered arrangement. This would be in equilibrium within a cell.

The flow of down a path from higher energy states to lower energy states and most ordered arrangement. Highest energy states to their most disordered arrangement.

Examining the simplest biological pathways one finds they are expressed in terms of Electrodynamical potentials rather then thermodynamically; therefore, electrodynamical processes are the lower energy states

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1B) Battery section enclosed

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